621.86
QEx2

The Excavating Engineer

(FORMERLY STEAM SHOVEL NEWS)

PUBLISHED MONTHLY

Ten Cents Per Copy *One Dollar Per Year*

Vol. 10 MILWAUKEE, NOVEMBER 1913 No. 2

CONTENTS

FRONT COVER ILLUSTRATION

McCartin Paving and Construction Company's 14-B Bucyrus Shovel Engaged on Road Work near Birmingham, Alabama.

Leading Articles

Construction of the Somerset Dam, Massachusetts 43
The High Powered Shovel for Ballast Pit Work 47
Revolving Shovel Work on the St. John and Quebec Railway 50

Miscellaneous Articles

Another Use for the Contractor's Automobile 46
Burlington Curve Elimination in Wyoming 49
Fast Work by a 2½ yard Shovel 51
A Severe Test for a Thrusting Gear 53
Shovel Work Under Difficulties on the Canadian Pacific Railway 52

Editorial

Construction Outlook 54
The Choice of Methods of Operation 54
The Last Lap at Panama 54
The Last Dipperful of Dirt Taken in Culebra Cut 55

Field Notes

Prevention of Clinkers 56
Wetting Down and Breaking Up Coal 56
An Approved Method of Lifting Dipper Handle 56
How to Shake the Grates 56

Devices You Ought to Know About

A Special Blast Hole Drill 57
Steam Shovel Chain 57
Explosives for Railroad Construction 58

Shots From the Firing Line

Brief Notes From Men in the Field 59

Index to Advertisers, Page 80.
Book Reviews, Page 55.

ADDRESS ALL COMMUNICATIONS TO

THE EXCAVATING ENGINEER PUBLISHING COMPANY

BRADLEE VAN BRUNT, Manager and Editor

267 NATIONAL AVENUE MILWAUKEE, WIS., U. S. A.

Copyright 1913, by The Excavating Engineer Publishing Co.

Fig. 1. The Somerset Dam Under Construction on the Deerfield River, Massachusetts.

Construction of the Somerset Dam, Massachusetts

THE Somerset Reservoir is a part of the extensive hydraulic power development that is now underway in the valley of the Deerfield River in Vermont and Massachusetts. This project is fully described in a series of three articles in the Engineering Record appearing February 1st, 8th, and 15th, 1913.

Although the possibilities of the Deerfield River were recognized some years ago, and some time was devoted to surveys and investigations, actual work was not begun until the fall of 1911.

A corporation, known as the New England Power Company, was organized to handle the project. The New England Power Company has contracted for the complete engineering and construction of all of its work with the Power Construction Company, a corporation organized to do general engineering and contracting, and particularly to handle the Deerfield River work. The Power Construction Company has its main offices in Shelburne Falls, Mass. J. G. White & Company, Inc., of New York City, are retained by the Power Construction Company as consulting engineers on all of its Deerfield River work, and Mr. Charles T. Main, of Boston, is retained in a similar capacity by the New England Power Company, while Mr. Frederic P. Sterns, of Boston, is retained by the New England Power Company as consulting engineer to advise on the storage reservoir problems only.

The Somerset reservoir is a storage reservoir located on the east branch of the Deerfield River, about 15 miles north of the nearest small town, Wilmington, Vermont, well up in the foothills of the Green Mountains, at an elevation of 2200 feet above the sea. It is the head of a series of reservoirs and power plants for the marketing of electric power throughout New England. Its construction has been carried out entirely by the Power Construction Company's own forces. Work started in September, 1911. The transportation of plant and supplies to the dam site has been at times difficult, although not as difficult as the remote location of the work would seem to indicate. There are no stores nearer to the work than at Wilmington, Vt., and at that point the stock of supplies is relatively limited. This has necessitated shipping every thing in from a distance,

Fig. 2. 60-C Bucyrus Shovel Digging the Cut for the Track from the Dam to the West Borrow Pit.

even such supplies as meat and provisions. All shipments reach the Hoosac Tunnel station by the Fitchburg Division of the Boston & Maine Railroad. At that point they are transferred to the narrow-gage cars of the Hoosac Tunnel & Wilmington Railroad and taken to Mountain Mills, two miles below Wilmington, Vt. From Mountain Mills a narrow-gage lumber railroad follows the Deerfield River, with a branch up to the site of the reservoir. Traffic arrangements between the narrow-gage road and the lumber road enable carload shipments to go through from Hoosac Tunnel to Somerset Reservoir without breaking bulk. The narrow-gage dinkey locomotives for construction use were sent in on their own wheels, and the steam shovels were also delivered at the work in this way, by means of trucks convertible from broad to narrow gage.

The camp is constructed in two general divisions, one part being for the foreign labor, which is mostly Italian and Austrian and the other part for the white or skilled labor. The buildings are relatively small and situated far enough away from one another to prevent the rapid spread of flames should a fire start. The houses are built of rough spruce lumber, with two-ply tar paper on the roofs and sides, and lined inside with ordinary building paper to make them warmer. Pure running water is supplied by gravity to the camp in general and to each house from a small reservoir on a brook above the camp. The general water system is also connected to the sluicing pumps, so that in case of fire these pumps can be thrown onto the line to give a large supply at proper pressure for fire purposes.

A sewerage system serves all parts of the camp, and electric lights are furnished by a generator located at the machine shop. All buildings are heated by wood-burning stoves.

The method of construction of the dam is an adaptation of the sluicing method. Two extensive borrow pits were located one about three quarters of a mile distant from the west end of the dam, and the other about three quarters of a mile from the east end. Two 60-C Bucyrus steam shovels, with 2½-yard dippers, were put to work, at the west end of the dam, making the cut for the track from the dam to the west borrow pit. The shovels worked gradually uphill at a grade not exceeding 5 per cent. through a succession of low-rock noses, with intervening draws, until the main borrow pit site was reached. This is a gently rising piece of land, consisting of earth, with a certain proportion of gravel and some boulders. A long gentle curve brings the tracks for the dump trains into the eastern end of the borrow pit site. A face was opened up at the lower side of the pit, the shovels working back and forth through the pit on two levels, one above the other, (see Fig. 3). The pit gradually rises, thus enabling the lower material to be used first for the lower sections of the

Fig. 3. Two 60-C Bucyrus Shovels in the West Borrow Pit.

dam. As the dam rises in height the grade of the tracks from the borrow pit is being gradually lessened although at the same time the shovels are rising slightly, owing to the general contour of the pit. 105 4-yd. Continental and Western Wheeled Scraper narrow gage cars are used, with ten American Locomotive Company's dinkies. These dinkies are the saddle-tank type, with cylinders either 10 in. by 16 in. or 11 in. by 16 in., and weighing about 19 tons each. Three trains of eight cars each are used to handle the output of each shovel, with a spare locomotive and train for emergencies.

from the shore ends of the trestle toward the center of the river. These earthfills were pushed out until the stream itself was reached. Rocks and boulders were then dumped into the stream and an earth blanket placed upon this until the flow of water was entirely stopped. The downstream toe-fill had progressed similarly from both ends of the dam, and this was closed in the same manner as the upstream dike. The river was thus held back, raising the pond at the right of Fig. 1, somewhat and turning the water into the completed concrete conduit, shown in the foreground. This enabled the entire site to be drained

Fig. 4. 70-C Bucyrus Shovel at Work in the East Borrow Pit.

A 70-C Bucyrus shovel likewise equipped with a 2½ yard dipper, is at work in the east pit about three quarters of a mile from the east end of the earth fill. It is served by four trains of nine cars each. All the shovels are equipped with Westinghouse air pumps for hammer drills for drilling boulders.

The dump trains take the material from the pits onto trestles built in 20 ft. lifts at the upstream and downstream sides of the dam. The material is dumped from these trestles, thus making two dikes or toe-fills (see Fig. 1). The up-stream dike was completed first, as shown, the dump being carried out and the final stripping of the stream bed was finished.

When the site was dry a pumping plant was installed for sluicing purposes, taking water from the pond above and supplying it along both toe-fills from 6-in. spiral pipe mains. The pumping plant consists of a battery of three 60 h. p. locomotive-type boilers, two Worthington 14x20x10¼x15-in. compound duplex pumps, each rated at 750 gal. per minute and good for 200 lb. pressure, with a Deane duplex pump 16x10½x12-in. as a spare for emergencies. The pumps maintain a pressure of from 150 to 175 pounds. The mains are fitted with tees and valves for connecting the heavy 3 inch rubber sluic-

ing hose. This hose is fitted with 1⅜ inch taper nozzles carried on stands. They are used as monitors to sluice down the material dumped in the toe-fills. On the outside slopes the material is thus washed down and packed into position. This operation not only carries the material down from the toe-

Fig. 5. 60-C Bucyrus, at Work in the West Borrow Pit.

fills toward the center, but sorts the material in such a manner that the finest is in the center section of the dam where a pool of water is maintained to facilitate this process. Alum is used in the sluicing in order to aid precipitation. The spillway channel is being cut out of the solid rock. A Keystone well driller put down 6 inch holes three abreast to the required depth along the spillway channel. These are shot with charges sufficiently heavy to break up the rock in sizes suitable to be handled by the steam shovels. About 160,000 yards of rock will be taken out in the manner and used as riprap on the up-stream face of the dam.

The job has been run in ten hour a day shifts during the past year up to June 1st, and 11 hour shifts thereafter.

In the month of May, 90,000 yards of earth were actually placed in the dam working 30 shovel hours a day. In the month of June 107,000 yards of earth were placed estimating 3½ yards to each car, which has in the past been found to be approximately correct. 35,000 yards were placed in one week in the month of June and the best day's run for one shovel has been 664 cars or 2324 yards.

Mr. George W. Bunnell, president of the Power Construction Company, says: "the quality of the material in the borrow pits makes the digging exceedingly hard, as is shown by the fact that Panama type manganese tooth points last on an average not over six days. The material is a very hard compact mixture of clay, earth and gravel with a considerable number of large boulders. It is so tough that it will stand vertical or overhang as the shovel works through the cut".

"About 250 men all told, including doctor, boarding house help, etc., are employed on the work this year. Some exceedingly interesting costs have been obtained. For instance during the best week in June the cost of placing the material on the dumps preparatory to sluicing was 12 cent a yard, which covered all labor, fuel, up-keep of tracks, operation of dinkies and shovels and all cost directly chargeable to the moving of earth, charges for repair parts, plants and superintendence. The similar costs for the entire month of May were 18 cents a yard with a cost for sluicing of 3 cents additional. Coal costs, laid down on the job, approximately $7.00 a ton."

Mr. George W. Bunnell is president and active administrative head of the Power Construction Company with offices at Shelbourne Falls, Mass. To him and to the Engineering Record we are indebted for the above material.

Another Use for the Contractor's Automobile

Roberts Brothers, of Chicago, are making very unique use of their automobiles as the accompanying photograph will testify. They have replaced the ordinary wheels with heavily reinforced ones fitted with steel railroad tires, and are using their six cylinder Wintons as locomotives. To these are coupled a train of flat cars for carrying men and material from the camp to the job. In order to turn the machine around, they have devised a turntable, consisting of a ten inch disc plate mounted on a pivotal bearing. The car rests on a pair of 35 lb. rails which are fitted with adjustable bridles, these rails are carried on the side of the machine as shown. The rails, when in place, are fitted to this disc in an ingenious manner. Two men can turn a car with

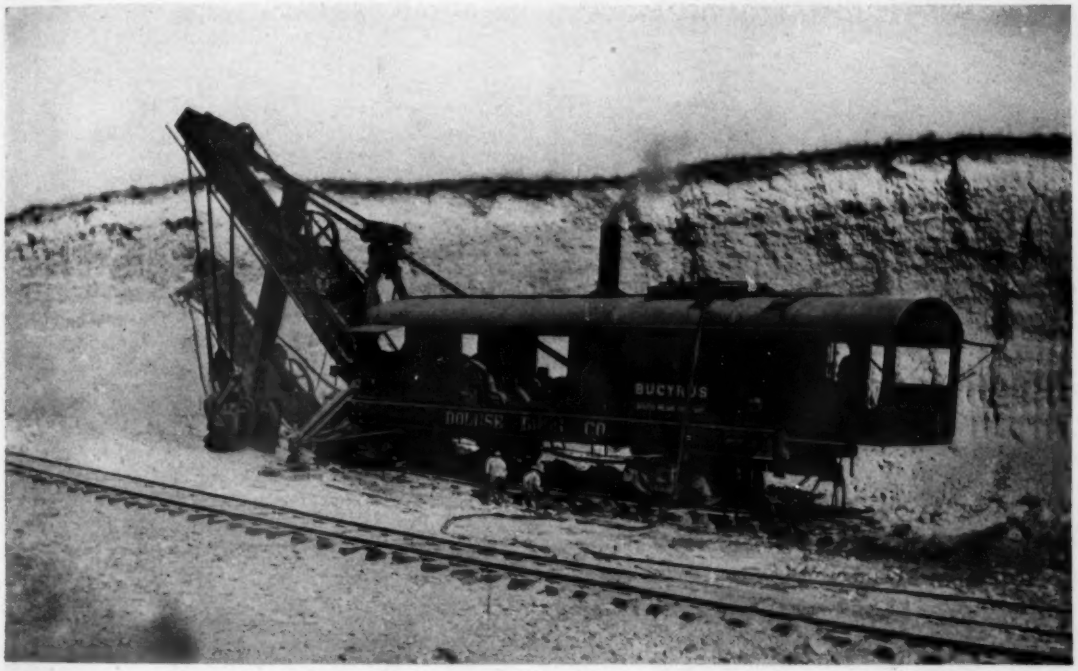
ease. Roberts Brothers state that no end of time and expense is saved in this way, not to mention much vexacious delay waiting for a locomotive. We are told that very high speed can be attained.

The High Powered Shovel for Ballast Pit Work

IN this day of intensive development there is a constant endeavor to discover and eliminate unnecessary waste in production. The field of excavation has more than once proved itself a rich one for such discoveries. The wastes may come from many sources; the misapplication of machinery, the uneconomical operation of an outfit, the use of hand labor where mechanical methods would be more profitable, and finally the failure to realize the value of putting in heavier and consequently more expensive machinery, when such machinery will do the work of lighter and less expensive equipment at a lower cost and a resulting higher profit. It is with this last point that we are here dealing.

In all parts of this country in open cut iron and copper mines, in rock quarries, in ballast pits and in construction work of a character that may be considered as comparatively permanent, we find instances of small shovels being used where larger ones would save the cost of powder, the drain of unnecessary repairs, the maintenance of superfluous equipment and labor, not to mention the assurance of a larger and a steadier output. Many instances may be found but we cite here a case where a broad minded policy was extremely successful.

The Chicago Rock Island and Pacific Railway have been reballasting their line between Pratt, Kansas, and Dalhart, Texas. The material was obtained from a ballast pit at Sand Springs, New Mexico. This material was extremely hard to dig. One and a half feet of sandy overburden capped a like depth of gypsum. This was underlaid by sand and gravel.

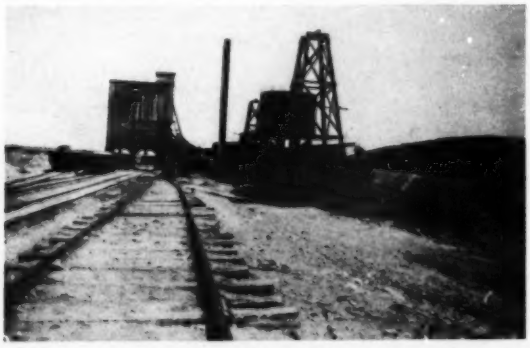


110-C Bucyrus Shovel, Dolese Bros. Co., in the C., R. I. & P. Ry. Ballast Pit, Sand Springs, N. M.

The gravel ranged in sizes up to 8 inches in diameter. In a few places this was soft and easily dug, but the greater part was firmly cemented together. In many places the formation was almost a solid sand stone.

When the railroad worked this pit they used a 65 ton shovel. With this machine they found it necessary to blast thoroughly, which made it a very expensive process. When Dolese Brothers Company of Chicago, took the contract from the

railroad, they proposed to dig the material unblasted with a 130 ton shovel. This the engineers considered was impossible. Notwithstanding they purchased a 110-C Bucyrus shovel and on February 27th, 1913, put it into the bank. Their experiment proved absolutely satisfactory in every respect. The shovel never stopped for anything. It proved that it had sufficient power to handle with no difficulty any material that it was called upon to dig.



The Crusher House, Tank and Power House.

The pit runs parallel to the main line of the Chicago, Rock Island & Pacific Railway and is connected thereto by a spur track about 150 feet in length. When the pit was first opened the shovel loaded on the same level, but as work progressed it ran into a cut, which resulted in its loading onto a track about 10 feet above the shovel track, necessitating practically a block and block lift. The face carried averaged from 20 to 30 feet in height. The material was loaded into a bottom dump car with a capacity of 39.6 cubic yards. Only one car and one locomotive were used. The haul to the crusher plant was about three quarters of a mile. There the material was dumped into a hopper beneath the track from which it was fed into two skip cars, mounted side by side on parallel inclined tracks. These skips dumped into a No. 7½ Allis-Chalmers crusher, after which the material was screened and the oversize fed into a No. 5 Allis-Chalmers crusher. It was then dumped irrespective of size, into gondola cars placed beneath the bins, shown in one of our views. The result has made an excellent road bed ballast, as the gravel and sand binds and with the gypsum, makes an extremely solid and substantial bed after it has been allowed to lie for a few months.

The capacity of the plant was fifty 100,000 pound cars a day.

The 110-C Bucyrus shovel weighs 130 tons in working trim and is equipped with 13″ x 16″ main and 9″ x 9″ boom and swinging engines. In general design it follows the same lines as the more generally known Bucyrus shovels, except that it is constructed with exceptional massiveness throughout. Cast steel circle, trucks, bolsters, forward journal boxes are among the features. It also has manganese steel racks and rack pinions. Although it is designed to carry a 6 cubic yard dipper, in this instance a dipper 2½ yards capacity was supplied, inasmuch as the severity of the digging was a more prominent feature in the problem than the necessity for a high output. As a matter of fact the shovel was idle easily 50% of the time waiting for cars as the output required was far below its normal capacity.

The shovel has proved extremely fast and easy to operate. The men in charge, S. C. Burtis, the superintendent, H. M. Reed, the runner, and L. B. Smith the cranesman, stated that it was as fast as a 70-C. Indeed, they had no difficulty in making five swings and dips in a minute. They dig about 2,000 cubic yards in a twelve hour day with one engine and car. In March they took out 36,000 yards with a loss of 2½ days, due to lack of cars and an accident in the crusher plant.

The shovel has never been delayed for serious repairs, in fact the only breakages were due to causes outside of the shovel, such as a boulder striking the dump lever.

For a while considerable trouble was experienced from the breakage of the dipper bale. When the shovel is in operation, the bale moves through a small angle but it was found to bind so tight that four men and two crowbars would make no impression. This resulted in gradual crystalization and eventual breakage. Upon investigation it was found that fine sand and gypsum had got in between the eye of the bale and the walls of the side frame casting on the dipper, and had packed in so hard that it was almost as hard as the steel itself.

110-C Bucyrus Going Into The Pit.

This caused the bale to bind. The trouble was remedied by drilling holes in the sides of the pockets, which allowed the material to work out.

About four tons of a good grade of soft coal were consumed in a twelve hour day. The water was pumped from two artesian wells, 600 and 800 feet

deep, and piped directly to the shovel, consequently, it was impossible to arrive at an estimate of the amount used.

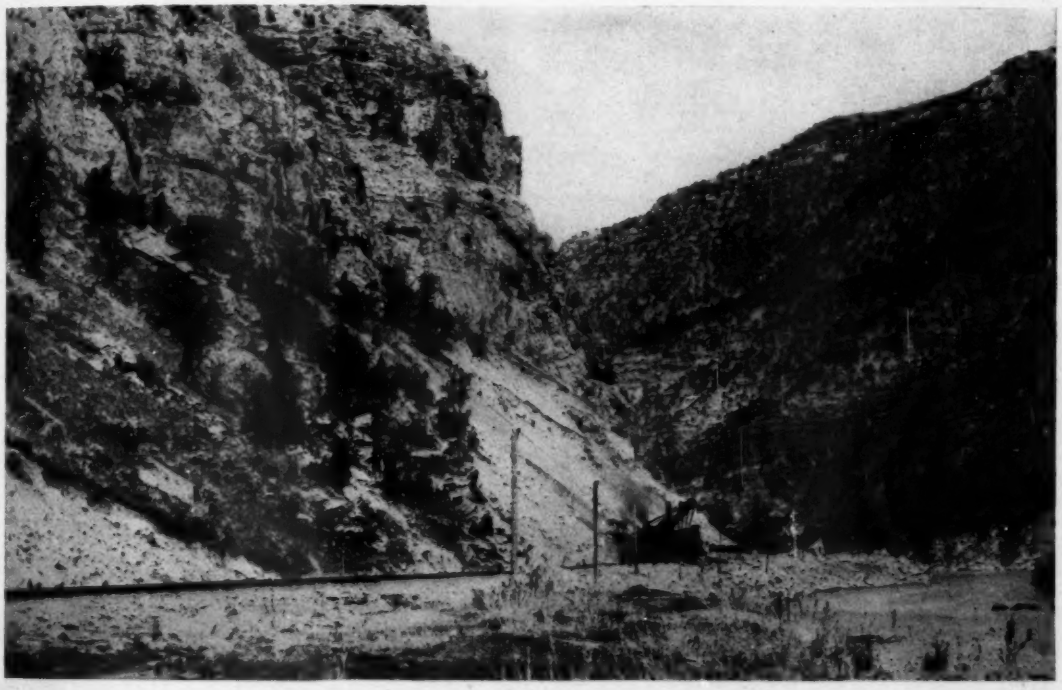
Burlington Curve Elimination in Wyoming.

In the Wind River Canyon, ten miles south of Thermopolis, Wyoming, the Chicago Burlington and Quincy Railroad, along with their general policy of curve elimination and grade reduction have a piece of excavation amounting to 225,000 cubic yards.

As shown in our illustration, the work which was to eliminate a sharp curve, necessitated a side hill cut 1000 feet long and from 75 to 160 feet high. The canyon at this point is about 2000 feet deep. The Railroad used a 100-C Bucyrus shovel and Haskell and Barker cars. The material handled was solid rock ledges and boulders. Some boulders have been encountered measuring 60'x80'x25'. These have been falling for ages from the 2000 foot wall of the canyon and the smaller ones have become cemented together, making extremely tough digging.

This formation was blasted with 60% Du Pont powder, and the material loaded into the Haskell and Barker cars. The cars had one side removed for the operation of a side plow and a Lidgerwood. The material was used for riprapping the embankment along the river, and was spread with a Jordan spreader. The haul was very long, 35 miles, which, with a decided scarcity of cars caused the shovel to be idle a great part of the time, in fact, its working time averaged three and four hours, and the output about 900 yards a day.

The most serious problem in connection with the work was presented by the high dangerous bank. The loading track was so close to the river that no space was left to allow the new cut to take a safe slope. This was overcome successfully by working the shovel into the cut and loading a train in the usual manner. When the train was loaded and had pulled away the shovel was backed out, men were sent to the top of the slope and the hill was worked down. The shovel was again set digging on the toe of the slope and the same process repeated until a safe angle was attained.



100-C Bucyrus Shovel in the Wind River Canyon, Wyoming.

A close examination of the photograph shows a 140 foot slope over the shovel, on the top of this slope men may be distinguished working it down.

Operations were commenced a year ago last September, but the work has been pushed only when rip rap was required.

We are indebted to V. A. Loomis, who operated the shovel, for this information.

Revolving Shovel Work on the St. John and Quebec Railway

O'CONNER Brothers of Meductic, York County, New Brunswick, have recently completed a contract for the construction of a line for the St. John and Quebec Railway. The interesting feature of the work was the operation of a Bucyrus revolving shovel under rather difficult conditions.

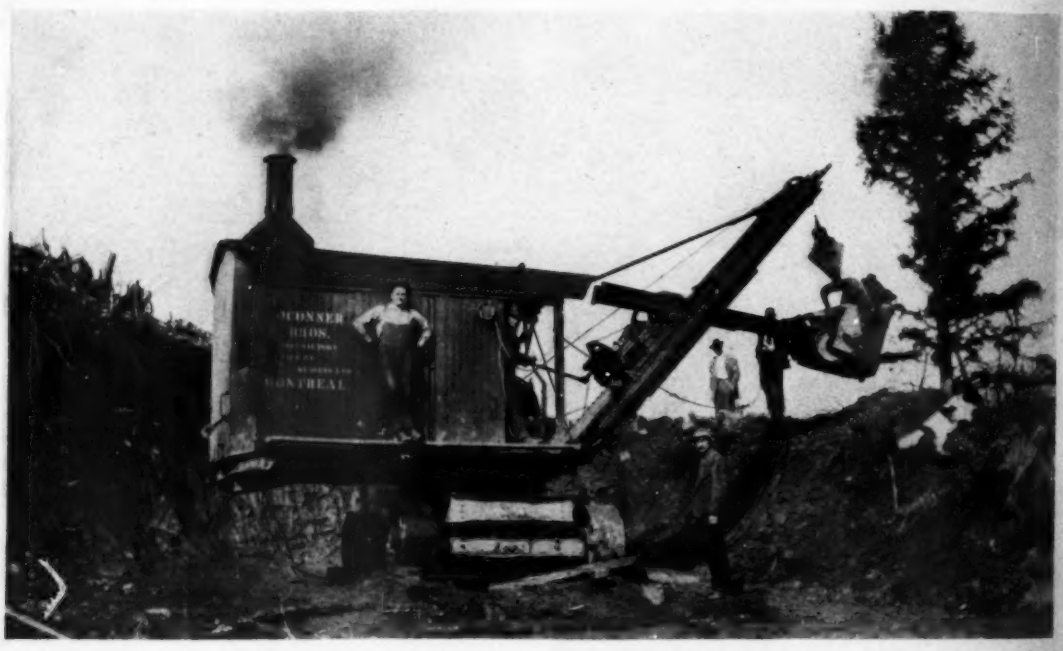
The contract consisted of a number of short thorough cuts. It was necessary to load in the rear of the shovel, as the width of the cut would not permit running a track alongside, consequently, it was purely a revolving shovel job.

The excavated material was hauled away in three yard dump cars and used for making fills. The material was blue clay capped with an overburden of gravel, solid enough in places to necessitate blasting. A B-6 Hardy hammer drill was used.

The cut which gave the contractors the greatest difficulty was through a hill side honey-combed with springs. The material here was so soft that it was impossible for the cars to hold it. Consequently, it was necessary to cast over, which, fortunately, they were able to do successfully.

One of our views gives a good idea of the character of this material. It was so soft that every time the dipper was dumped, the whole mass moved toward the river bank about two hundred feet away.

The conditions were so disadvantageous that a good day's run was a very difficult thing to obtain, the best output being about 400 cubic yards.



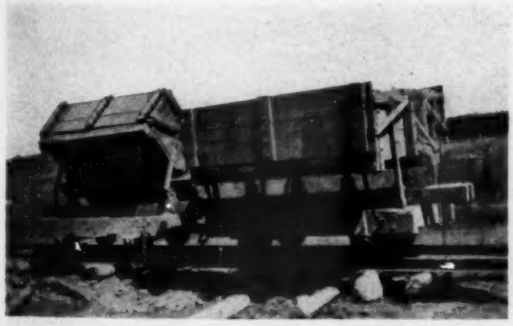
O'Conner Brothers' 14-B Bucyrus Shovel on the St. J. & Q. Ry.

The shovel work was started in cold weather and considerable trouble was experienced in getting water to the shovel without freezing. This was overcome by tapping the steam line above the injector valve and carrying it under the main engine down to where the water line passes through the center gudgeon, as it was found that the freezing occurred here the most frequently. The water was pumped by a hand pump. Coal was hauled eight miles from the railway and cost $7.15 a ton delivered at their shed. The total cost of operation ran about $24.00 per day.

Dumping—Note how the material slips.

The shovel was a 14-B Bucyrus equipped with a ⅝ yard dipper and mounted on traction wheels.

The three yard dump cars, which we illustrate were built by the contractors on the job. The



O'Connor Brothers' 3-Yard Dump Cars

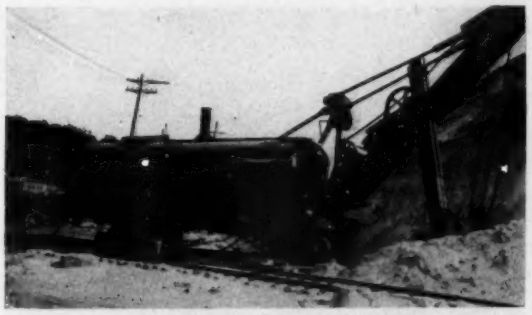
wheels and trucks were made in Woodstock, N. B. The cars cost about $80.00 each when completed.

The job is one where the efficiency of the revolving shovel stands out in a very strong light. It is the only type of excavator that could possibly have been used with success.

Fast Work by a 2½ Yard Shovel.

The Maine Central Railroad is at the present time constructing a cut-off between Portland, Maine and Montreal, Canada, in order to reduce the running time between these two points by twelve hours. The excavation is being done by Lathrop & Shea Company, of New Haven, Connecticut, with a 70-C Bucyrus shovel.

Work was started on the 23rd day of June, when the shovel was put to work excavating for a new depot for the Maine Central Railroad at Rumford Falls, Maine. The work consisted of removing a hill amounting to about 70,000 yards of hard pan and boulders. The material was sufficiently hard to necessitate blasting. A problem was encountered here, however, by the fact that the shooting was close to buildings and railroad cars, consequently considerable care had to be exercised. Black powder was used and toe holes were drilled at the bottom of the 71 foot cut, about six feet apart. Of course this, together with delays occasioned by



Lathrop & Shea Company's 70-C Bucyrus at Rumford Falls, Maine.

congestion on the main line, held up the shovel considerably but the average putput was about 1000 yards in ten hours. The excavated material was used for filling for the new line, the haul being approximately 2½ miles.

James Carmody, the engineer on the shovel advises us that the shovel has loaded ten 12 yard air dump cars in 7 minutes, which is extremely fast going. Dan Carmody was cranesman. The shovel was operated by a regular crew at standard wages with a ground gang of four laborers at $2.00 a piece per day. Two tons of coal and about 4,000 gallons of water were consumed a day.

There is still 21 miles of this road to be built, from Kenebago to Megantic, Me., at which point a connection will be made with the Canadian Pacific. This will open up some splendid timber land in northern Maine. This extension will be started early in the spring.

The shovel is now engaged in making a new yard in connection with the Rumford Falls depot.

Shovel Work Under Difficulties on the Canadian Pacific Railway.

On his recent contract on the Canadian Pacific Railway, Fred Hupp certainly had his share of bad luck. We publish here a few illustrations of his 70 ton and 70-C Bucyrus shovels in trouble. In both cases it will be seen that the body of the shovel was

Digging out Hupp's 70 ton Bucyrus.

completely cut away from the boom and carried down hill by the land slide.

The contract was in the mountains about 60 miles from Vancouver, B. C. Both shovels had to be dug out by hand and repaired. Fortunately no men were killed as the slide occurred at the noon hour. A.W. Cockran was engineer on the 70-ton and Dan Devoe ran the 70-C.

The 70C partially buried.

One of the illustrations shows the 70 ton rebuilt with a home made house. To the right of the picture will be seen a shoot adapted by Mr. Hupp for double tracking on the side of a hill. The body of a dump car was used and the slide was mounted on this. The method of mounting is shown clearly

Hupp's 70 ton Bucyrus Rebuilt. The Shoot to the Right.

in the photographs. It is moved along as the shovel advances by means of a cable attached to the jack arm of the shovel. This device not only did away with the necessity for an extra long boom but eliminated unnecessary dump car equipment.

The illustration shows the outfit preparing to move ahead.

Tribulations

"What are you crying for Sally," said her mother, "you got four invitations to that party, you ought to be very happy!" "yes, but, I told the first one I would go with him" replied Sally, "and the fourth was the long panter".

A Severe Test for a Thrusting Gear.

It is difficult for those who are not engaged occasionally in computing stresses to realize what tremendous forces are brought to bear on the machinery of a shovel. In order to build a machine that will stand up under the punishment occasioned by hard digging, the manufacturers not only must do some very careful computing in order to design each part with a strength that will withstand the heaviest estimated stress, but they must add thereto extra strength as a "factor of safety".

The accompanying illustration shows a thrusting gear for a Bucyrus 70-C shovel, which has undergone a very severe test. In the course of manufacture a small blow hole was discovered and the gear, in persuant with the manufacturers' accustomed practice, was put under the drop hammer to be broken up for scrap.

To reduce it to the condition shown, required four blows from a 2600 pound drop hammer falling a distance of 55 feet. It would take a considerable blast to wreck this gear if the shovel were in a rock cut!

The gear is made of the regulation Bucyrus low-carbon steel, single annealed.

This 95-ton Bucyrus shovel holds the record for the greatest daily output upon the Panama Canal, since the first American shovel started digging on November 11, 1904, and indeed, since the French started operations on January 20, 1882. According to official reports, the shovel loaded 4823 cubic yards of earth on 235 Lidgerwood cars in eight hours. The actual loading time was five hours and twenty minutes. This amounts to 603 yards per hour for every hour under steam and 905 yards per hour for every hour of actual digging.

The Excavating Engineer

[FORMERLY STEAM SHOVEL NEWS]

A Monthly Publication Devoted to Excavating *and* Allied Subjects

Subscriptions, payable in advance, $1.00 a year for 12 numbers, 50 cents for six months.

To foreign countries, including postage, $1.00 or its equivalent, 4 shillings; 4 marks; or 5 francs.

Notice to discontinue should be written to the Milwaukee Office in every instance.

Advertising copy should reach Milwaukee Office by 10th of month, before date of issue.

Address all communications to the company.

THE EXCAVATING ENGINEER PUBLISHING CO.

Bradley Van Brunt, Manager *and* Editor

267 National Avenue Milwaukee, Wis., U. S. A.

The Last Lap at Panama

On October 10th, at a touch of a button by President Wilson, the Gamboa Dike was destroyed, thereby signalizing the last of the great construction epochs in the history of the Panama Canal.

To complete the canal the work will, from now on, consist largely in putting on the finishing touches. The world at large will proclaim this as one of the greatest achievements of the age, but our readers know better than the world at large what it means to finish a job of this magnitude in such a wonderfully efficient manner, on schedule time.

Construction Outlook

There seems to be a general tendency towards pessimism abroad in the construction field. As we pointed out last month this appears to be due to the poor condition of the railroads, the low net earnings as compared to the improving gross earnings. This, of course, is distinctly disappointing.

As a matter of fact, all the principle eastern roads are about to present a petition to the Interstate Commerce Commission, asking permission to increase their rates on all shipments except grain, coal, etc. As the increase asked for will probably be about 5% it would be scarcely felt by the general public. The impression exists that the Commission will look upon this petition favorably. Should this happen, there is no doubt but that conditions will improve rapidly during the Winter.

There seems to be a picking up in the railroad construction field, a number of jobs are being offered, and a gratifying increase over last month of small contracts awarded has been noted.

The general situation is better than for some time past.

The Choice of Methods of Operation

We publish in this number an article dealing with the economical use of a heavy shovel on work where the required output is far below the capacity of the shovel; in other words, where the machine is idle a great part of the time, yet where its great power is the determining factor in the economy of operation.

This is just one of many examples of the recent application of the theory of scientific management to the excavating field. We know of many others.

Competition and rapid development has brought on a period of intensive development. This in turn has led to the study of methods with the view of detecting and eliminating the causes of unnecessary waste in production and operation.

The new school of contractors recognize this, but there are many old line men who prefer to stick by the "old reliable" instead of striking out into new fields; fields where a dragline excavator is used in preference to a shovel, or a shovel where teams had formerly held sway. These fields appear to them untried, dangerous, and to take a chance therein, unnecessary recklessness.

Were we as a nation more conservative and more thrifty, doubtless we would not hear in such piercing tones the ever present hue and cry of high cost of living, and yet there is a point where conservatism becomes actually dangerous.

There was once an old-line contractor who through years of steady plugging and sticking to the job had cleared up a sum which netted him a comfortable income. Finally a dull season came around, as dull seasons are wont to do in the best regulated countries. Keener competition for the most desirable jobs had brought forth a school of men who were willing to take the work at a price that would make the old line man turn cold. He stood aside and watched the "fools rush in" and unwillingly took one of the few less desirable jobs left. He was forced, however, to take it at a price that scarcely cleared him a profit.

Things did not go well, and what made matters worse, things appeared to go extremely well with his friend, the fool who "rushed in". One day he was persuaded to visit this job and find out a few things for himself. He visited the job and proceeded

to find out more things than he had ever imagined before.

Six months later he had made good on one of the most desirable jobs of the season by the simple expedient of studying the proposition from the point of view of the experience of others and using machinery adapted to his particular requirements.

The same thing is happening every day. A conservative contractor can satisfy himself by asking the manufacturer to tell him where he may see an installation of the kind proposed. It is not necessary to take a risk. The contractor need but profit by the experience of others.

The Last Dipperful of Dirt Taken in Culebra Cut

The accompanying photograph shows the last dipperful of dirt taken in Culebra Cut. To Albert H. Geddis the operator, W. T. Hudson the cranesman and to their Bucyrus shovel Commission No. 226 belongs the honor. 10:54 A. M., September 10th was the time. Bucyrus shovel No. 204, manned by H. S. Hayes and A. E. Alexander, was also in on the finish.

The Last Dipperful of Dirt Taken Out of Culebra Cut.

As the last train pulled out of the cut loaded with the dirt dug by these two shovels, it was met all along the line with a tremendous ovation, in fact, by the greatest demonstration that has ever been made under any circumstances on the Isthmus. Steam shovel, and engine whistles, hand-clapping and every conceivable variety of applause greeted the train as she steamed on to make the excavation of Culebra Cut a matter of History.

Mr. Geddis, who, of course, was the hero of the occasion, has been in the Culebra Cut for nearly nine years and has given the Commission constant and excellent service.

A. B. STETSON DIES.

On Monday, October 27th, A. B. Stetson, of the Bucyrus Company, died in the Milwaukee Hospital at the age of seventy-two years. His death followed an operation performed three weeks previously. Mr. Stetson's connection with the Bucyrus Company dated from 1888 when he became superintendent of the old plant in Bucyrus, Ohio. He superintended the construction of the new plant in South Milwaukee and was general superintendent for ten years, becoming vice-president of the company in 1901.

For the greater part of his life, Mr. Stetson was identified with various dredging and gold mining interests. In 1904 he resigned as vice-president of the Bucyrus Company to devote his time exclusively to these interests. A few years later he again became associated with the Bucyrus Company as consulting engineer, in which capacity he remained until his death. During the last year much of his time was devoted to the supervision of gold dredging operations in Idaho. About a month ago, while so engaged, a severe illness necessitated his return to Milwaukee where the operation took place which culminated in his death.

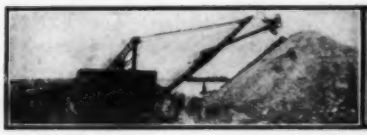
Mr. Stetson served through the Civil War, and at the suspension of hostilities, was honorably discharged with the rank of colonel.

He was one of the first Americans to be identified with the construction of the Panama Canal. During the early 80's he spent several years on the Isthmus upon a contract which he had secured under the old French company.

He was closely identified with the operation and manufacture of gold dredges ever since the birth of that industry in this country.

During his connection with the Bucyrus Company, he had occasion to visit all parts of North and South America in the investigation of various dredging and mining propositions.

In all his associations, both social and professional, Mr. Stetson had a peculiar faculty of endearing himself to all those with whom he came in contact. The memory of this splendid type of "a gentleman of the old school" will be long remembered by the host of dredgemen who have been proud to hold themselves his friends.



FIELD NOTES

DISCUSSION IS INVITED FROM MEN IN THE FIELD ON SUBJECTS HERE PRESENTED

Prevention of Clinkers

Correct principles of firing are essential in order to obtain as much steam from a pound of coal as possible. By the adoption of such principles, troubles such as the formation of clinkers can be greatly diminished.

Almost any fire can be clinkered by stirring it up with a hook so that green coal gets down on the grates. A fire can also be clinkered by shaking the grate so hard that green coal works its way down through the fire. With some classes of coal, heavy firing which causes banks to form in some portions of the fire will start clinkers. When a clinker has been formed in a firebox it can sometimes be broken up by shaking the grates with short, quick jerks, but as a general rule in order to get rid of it the fire must be cleaned. Trouble due to clinkered fires can be materially reduced by not shaking the grates so hard, not using the hook or slice bar so often, and by careful firing to prevent the formation of banks in the fire.

Wetting Down and Breaking Up Coal

In wetting down coal it is well to use as little water as possible, just enough to keep the dust down. Fine coal or slack should be wet just enough to hold it together until it cakes or cokes; otherwise this fine coal will be pulled straight through the flues by the exhaust without having had an opportunity to burn.

Coal should be broken to about the size of a man's fist before being fired. This allows it to be spread more evenly over the fire and permits it to burn faster than when fired in big lumps.

An Approved Method of Lifting Dipper Handles.

We publish below a simple and safe method of raising the dipper handles and putting them in place, suggested by George W. Williams. His method follows:—

The dipper handles are lying to one side of the car with the dipper at the far end. The hoisting chain has been led over the point of boom sheave.

Attach end of chain to padlock on dipper bale. Take a bite in the chain and drop it between dipper sticks just back of dipper hinges. Stick a bar through loop this will make the chain lead from the padlock to the handle and then up to the sheave on the point of the boom. Raise sticks and swing to the center of the car.

Place two planks lengthwise under end of sticks up against the car door allowing the sticks to clear the door. Place block under racks so that handle will slide without teeth catching on floor of car.

Remove bar from bite in chain. The end of the chain is still in the padlock.

Pull dipper back until sticks rest against the end of the carbody.

Raise handles slightly and slip blocks under dipper on either side of latch keeper so as to keep dipper from rolling.

Drop loop in chain between sticks again and slip in bar. Move shovel back until the ends of the sticks when raised will clear shipper shaft.

The yoke is thrown back on the boom. Don't loosen nuts as liners will be lost.

Allow ends of sticks to rest on the pinions. Don't allow teeth to mesh.

Throw yoke block between sticks.

Move shovel ahead slowly pulling in with boom engines until teeth catch. By the time the car and the shovel come together the sticks will be two feet up. This is a safe and simple method. One hitch does the trick.

If anyone knows a better one we would be glad to hear from him.

How To Shake The Grates

With a fire that has a tendency to clinker the grates should be shaken with sharp, quick jerks, which will tend to break up the clinker and allow the air to pass through it to the fire; but with a coal that does not clinker it is advisable to shake the grates easily so as not to disturb the fire any more than necessary. The grates should be shaken just often enough to keep the fire clean. The question as to when the grates should be shaken depends upon the class of coal being used, and no general rule can be given covering this.

The Poetry of Railroading

The oft quoted Finnigan has a rival in Pat Donohue, an Ohio freight conductor whose train had a breakdown recently. After the accident he sent this message to train dispatcher Straight:

Two-twenty-two has a busted flue. What shall I do.
Donahoe.

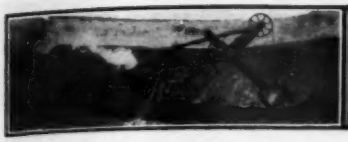
This awakened the slumbering muse in the telegraph office, and the reply ran:

Wait. Two-twenty-eight will take your freight.
Dispatcher Straight.
—*Exchange.*

His Snap

"By gorry, I'm tired"!

"There you go! You're tired! Here I be a-standin' over a hot stove all day and you wurkin' in a nice cool sewer"!
—*The Masses*



DEVICES YOU OUGHT TO KNOW ABOUT

A Special Blast Hole Drill.

In quarry operation, the drilling of the rock to keep the steam shovels and crushers busy, has always been a problem. For many years, the cable drills used for blast hole drilling were not designed particularly for this purpose. Recently, however, a drill has appeared which has been designed with especial reference to blast hole work, in contradistinction to water well work. This drill is manufactured by the Armstrong Mfg. Company, of Waterloo, Iowa.

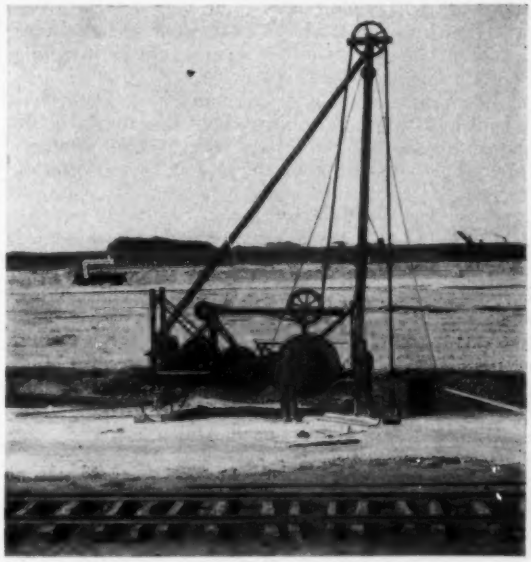
One who is familiar with cable drills, knows that in the past the proper motion of a drill was supposed to have been elliptical. In other words, the tool should rise slowly and drop quickly. This principal has been at the back of most drills in the past. The Armstrong is built on a different principle, namely, "quicker the tools can be raised the greater the number of strokes per minute". In other words, any machine which does not raise the tools as fast as the laws of gravity will permit them to drop, is uneconomical of time. This is accomplished in the Armstrong by a special motion, and which furthermore, is claimed to reduce the whip of the rope and consequently the wear and tear.

Many other features of the drill are unique, for instance, the band wheel instead of being set to one side or up on the trestle work, is placed down between the two long sills, which is said to reduce strain and increase the strength of the machine. The gasoline engine is especially designed for this purpose and manufactured in their own factory.

We illustrate, herewith, an Armstrong blast hole drill used by the Casparis Stone Company of Columbus, Ohio, in their quarry at Fairmount, Illinois. For a continuous period of 139 days, it averaged 76.6 feet per day the average fuel consumption amounting approximately seven gallons of gasoline per day. We give a few of the records made by the machine.

113 feet solid limestone in eleven hours on five gallons, moving and setting machine eight times; 329 feet in three consective days on 20 gallons of gasoline, moving and setting machine 24 times, giving an average of 109.66 feet per day; 574 feet in six consecutive days on 38 gallons of gasoline moving and setting 40 times, giving an average of 95.66 feet per day, during these six days there was a delay of 3 hours and 45 minutes in turning the machine around at the end of the ledge and repairing broken inlet valve on engine, the last day of drilling was in raveling rock; 2255 feet in 28 consecutive days, an average of 80.6 feet per day, or an average of 7.32 feet per hour for 308 consecutive hours; 3885 feet in 53 consecutive days, an average of 73.3 feet per day or 6.66 feet per hour for 583 consecutive hours; average fuel consumption per day for 53 days, 7 gallons.

The above records are figured on 11 hours of operation per day and there is no account taken of delays for moving or any other causes.



An Armstrong Blast Hole Drill at work in the Casparis Stone Company's Quarry.

The manufacturers claim that from the first of December 1912 to the first of March 1913, the Armstrong machine drilled 53% more holes than the average of the six competing machines, which seems to substantiate the correctness of this new theory.

Steam Shovel Chain.

The Columbus Chain Company of Columbus, Ohio, are now making what they call their "Hercules Solid Weld" steam shovel chain.

They have spent a great many years of labor and investigation in getting a special iron suitable for steam shovel chain and in training a select number of skillful chainmakers to put it together so it will hold. They have now succeeded in doing this and claim for their "Hercules Chain" that it will actually wear out before the links will separate.

Hercules chain is now used all over the world, having dug a very large part of the Panama Canal, dredged the Harbor of Havana, and used on a number of the large railroad systems of the United States and

Canada. Where it has shown the best results, is in stone quarries and rock work where the service required is of the very heaviest and where the chain soon goes to pieces if it is not made right. Some of their Hercules chains are said to have been operated in rock work and run every day for a full year, continuous service, without developing a single broken link. Hercules chain is a little higher in in price than other steam shovel chains but the Columbus Chain Company have gone on the principle that an operator buys a steam shovel chain for the service he can get out of it, and that he is willing to pay a fair price for this service.

The Columbus Chain Company issue from time to time a little circular telling about this special chain and giving testimonial letters from leading contractors. They will be glad to send it to any one on request.

Explosives for Railroad Construction.

The use of explosives for railroad construction is like the use of anything else; in order to get the right results, it is necessary to use the right tool. Many contractors have not been in the habit of giving sufficient study to the proper grades of powder for certain conditions, and consequently, they have not obtained as good results as they might have, had they given the matter more thorough study.

A booklet, "Independent Brands of Dynamite", published by the Independent Powder Company of Joplin, Missouri, precribes the kind and grade of explosives which will give the best results under

various conditions. There are four grades of Independent powder which have been found adaptable to different phases of railroad work.

Independent Gellatin should always be used in wet work and in tunnels where ventilation is poor.

Sampson Brand is the most economical to use in hard, tight work and in "popping" boulders.

Independent Brand, used in connection with black blasting powder or Jupiter Powder, proves the cheapest in large cuts where the work is dry.

Peerless and Eclipse, the low freezing grades, are good rock breakers not easily affected by cold and are therefore very convenient and economical for railroad work in winter.

The above photographs show a large shot made in the spring of 1911 by the List & Gifford Construction Co. on the M. K. & T. Ry. work at Joplin, Mo. A combination of black blasting powder and Independent Brand dynamite was used, the charge being 130 kegs of FFF powder and 3,000 pounds of 50% strength Independent Dynamite. This was loaded in 18 holes, 36 feet deep, well squibbled before loading. The whole side hill of solid rock was blown down and out of the way in one operation. After the blast very little trimming was necessary to make the roadbed.

In large operations such as this the selection of the proper explosive is more important than is ordinarily realized.

SHOTS FROM THE FIRING LINE

Alabama

Notes from Birmingham and Vicinity

By R. S. Byron

The levee contractors along the Mississippi are beginning to cheer up a little as the weather has been greatly improved the latter part of October. From the 1st of September to the middle of October the contractors have seen nothing but rain, but the prospects look very much better at this writing.

Mr. James Flynn is installing a Class 24 Bucyrus dragline for Hearin & Ryan on their levee work near Baton Rouge La. and Mr. Hearin expects to make dirt move in a few days, with this machine, although Mr. Hearin has made dirt move for the last twenty-four years.

J. S. Douglas of Dixie, La., was awarded contract by the Caddo Levee Board of Shreveport for the construction of a drainage canal near Shreveport. This canal is seven miles long and consists of 1,250,000 yards. This canal will drain over 100,000 acres of rich land and will be a great benefit to Shreveport and its vicinity. Mr. Douglas will do this work with dragline machines. The work is to be completed in two years. Owing to the abundance of natural gas in this territory, Mr. Douglas will use gas for fuel. The above work has been held up by an injunction being served but this is expected to be raised in 30 days, and as soon as same is dissolved Mr. Douglas will start work immediately.

The double tracking of the L. & N. Ry. between Nashville and Birmingham is gradually nearing completion. Contractors are moving their forces off and onto other work. Seventy-five per cent of the new track is down and in use. The line is to be completed by March 1st 1914. After the above double tracking is completed the L. & N. will start double tracking the line from Nashville to Louisville.

The brick manufacturers in this district seem to be satisfied with their sales up to this writing, and some are contemplating enlarging their plants.

The Sibley-Minge Brick Co. of Warrior, Ala. report that their plant is running to its full capacity.

The Asheville Construction Co. have completed their L. & N. work near Warrior and are looking around for some more work. They can be addressed care Brown-Marx Bldg., Birmingham.

The Dameron White Co. Ltd., of Baton Rouge are moving one of their draglines from the Red River onto their levee work near Vicksburg. The above company have had these two machines up the Red River above Shreveport for the past two years, and have been unable to get these machines out on account of the low stage of water in the Red River for the past few years. These machines are loaded on barges.

C. O. Chamblee of Birmingham, Ala. has finished his L. & N. work up in Kentucky and is open for another good job. Mr. Chamblee can be reached at 1038 First National Bank Bldg., Birmingham.

Mr. E. M. Alexander has taken a position with the Morrow Kennedy Co. on their Southern Ry. work near Atlanta.

The Dailey Construction Co., of Chattanooga, Tenn., are installing a new 70-C shovel on their new work near Cincinnati.

Capt. Jack Donovant was a caller one day recently, and says his L. & N. work at Warrior, Ala. is progressing nicely.

Jas. T. McCarthy & Co. of Gainesville, Fla. have just been awarded a contract by Gulf, Florida & Alabama Ry. for the building of a 50 mile extension from Broughton to Pine Hill, Ala. The excavation will amount to approximately 1,500,000 cubic yards, and the work to be completed by September 1st, 1914. Jas. T. McCarthy & Co. have just placed an order with the Bucyrus Co. through the Birmingham office for two 60-C steam shovels for prompt shipment. Mr. Jas. T. McCarthy will have personal charge of the work.

The U. S. board of engineers of New Orleans, La., under Major C. O. Sherrill have moved their offices from the Metropolitan Bank Bldg. to the 12th floor of the Queen & Cresent Bldg.

Hamilton & Howell of St. Francesville, La., has let some of their levee work to the Southern Dredging Co. of Baton Rouge. The work is near St. Francesville and consists of 90,000 yards, and is to be completed by February 1st, 1914. Mr. Ogden of the Southern Dredging Co. advised that he will use one of his class 24 Bucyrus draglines on this work.

Slag is moving in great quantities in this district. Mr. Solon Jacobs of the Birmingham Slag Co. advises that he has been forced to put on another steam shovel to handle his slag orders. He now has four shovels in operation. The ballasting of the new L. & N. double track between Nashville and here has been a big boost to the slag man.

Bids were opened October 1st by the Caddo Levee Board of Shreveport for building drainage canal in Caddo Parish, yardage 1,250,000. Bids were as follows: Dameron White Co., Baton Rouge, La. 13.5; E. J. Scott, Pittsburg, Kans., 14.40; D. B. Gore & Co. Crowley, La., 12.24; Hampton Reynolds, New Orleans, La., 15c.; Canal Construction Co., Chicago, Ill., 14.95; Epple & Barbour Shreveport, La., 16.24; Harris & Crow, Mt. Pleasant, Tenn., 13.94; Southern Dredging Co. Baton Rouge, La., 13.9; J. S. Codifere, Fort Adams, Miss., 17c.; J. S. Douglas, Dixie, La., 11.95.

The city council of Birmingham is contemplating the building viaducts over the railroad crossings in the down town district. The estimated cost of these viaducts is $5,000,000.00. It is reported that one viaduct will be started in a short time.

Reports from Atlanta state that the Morrow-Kennedy Contracting Co. of that city are getting along very well with their Southern Ry. work near Atlanta, where they are using a 60-C and 40-C Bucyrus shovel.

Mr. T. R. Lucas an old shovel runner has just finished with C. W. Lane & Co. of Atlanta, Ga. on their Bucyrus 85-C shovel and is open for a position. He can be reached at 213 East 3rd St., Jacksonville, Florida.

Reports from Nashville state that, A. G. Fretwell, T. Towles & Co. and Walton McDowell Co. who are doing L. & N. work in and around Nashville are progressing rapidly with their work. They report that they are experiencing fine weather.

Mr. Cordeal of the Western Wheeled Scraper Co. was a caller in this city last week on his return trip from Florida.

Mr. T. W. Crow of Crow & Harris of Mt. Pleasant, Tenn., has left for Montana to look over a large government job. The above company now have two Bucyrus draglines in operation in Montana near the Canadian border.

There is a large piece of work coming up in Florida to be awarded on the 10th day of November, 1913. The work consists of constructing 22 miles of drainage canals, and 27½ miles of

dikes. The yardage contained in the above work is as follows: 1,038,000 cubic yards earth excavated and placed in spoil banks. 792,000 cubic yards earth excavated and placed in dikes. 215,000 cubic yards rock excavated and placed in spoil banks and dikes. Twenty-seven and a half miles muck trench excavated and back filled. This work is to be awarded by the Everglades Sugar & Land Co. of Miami, Fla. This seems like good dragline work, especially for machines mounted on caterpillar traction equipment.

California

Notes from San Francisco

The Daniel Contracting Company are getting well started on their work at McNears Point on San Francisco Bay, having two Bucyrus 70 ton shovels, and one Bucyrus 65 ton shovel, with the necessary complement of locomotives and 4-yard cars. The waste material is being dumped along the water front near their quarry, forming a fill which will probably later be used by an electric road terminating at McNears Landing. The rock that they are excavating is being used on a section of the new quay wall in San Francisco, and also on some harbor work which is being done by the San Francisco, Oakland & San Jose railway on the Oakland Water Front, just opposite San Francisco.

The estate of Chas. Erickson and Gus Petterson have recently arranged for a division of the equipment belonging to the former firm of Erickson & Petterson, and part of this equipment will be placed on the market.

Palmer, McBryde & Quayle, San Francisco, have been awarded contract for grading for second track from Richmond to Bay Point for the Santa Fe system and will use a standard gage outfit. Additional contract will be let soon for second track from Bay Point to Stockton.

Colfax—Southern Pacific railway is to increase its yard space at Colfax. Chadwick & Sykes, San Francisco have the contract for about 130,000 cubic yards steam shovel work.

Williams—Atchison, Topeka & Santa Fe railway has awarded contract to Harlan & Harlan, Williams, California, for grading right-of-way in Contra Costa county. Work will require removal of about 120,000 cubic yards of earth.

Los Angeles—Contract has been awarded Robert Sherer & Co., Pacific Electric building, Los Angeles, by the Trona railway for construction of proposed 38-mile line. Contract price, $400,000.

Canada

News from Montreal

Re Welland Canal—Section 1. The contractors on section 1, Dominion Dredging Co., have started to work. They have two of their large elevator dredges on their job now and expect to start their 85-C Bucyrus shovel and Bucyrus dragline shortly.

Section 2. The government has called for tenders for this section, which closed on October 15th. This is principally a steam shovel proposition.

Section 3. This section is now under way, contractors, The Confederation Construction Co., Thorold, Ont., superintendent, J. Lester Simmons. The contractors have to supply crushed stone from this section to all the other sections. This will necessitate a big crushing plant which it is estimated will cost in the neighborhood of two-hundred thousand dollars.

Sections 4, 5, 6 and 7 will shortly be called for by the government.

Tom McGovern, of Rochester, is running a Marion model 60 for the Confederation Construction Co. on the Welland canal at Thorold, Ont. Tom was born in Thorold.

Tom Flannery is running a Marion model 60 for the Confederation Construction Co. on the Welland canal, at Thorold, Ont.

Soper & Mc Dougall, of Ottawa, are double tracking some eight miles of the Intercolonial from St. Romuald to Chaudiere.

Work is being pushed ahead on the new Welland Ship Canal. The contractors on Section 1 are preparing for extension operations. A large dredge is on the ground now making a channel. It is expected that a big change will be made on the scene of operations within the next few weeks.

The contract for Section 2 was awarded to Baldry, Yerburgh and Hutchinson, of St. Catharines. This is about a five million dollar contract, principally steam shovel work.

On Section 3 the Confederation Construction Co. are at present building their shops and at the same time have three shovels in operation, diverting the main line of the Grand Trunk Railway, which at present runs through the line of the Ship Canal. Two more shovels are on the way and a big force will be at work shortly.

The Cook Construction Co. are doing very good work on the Montreal Aqueduct with their class 24 Bucyrus drag line. This machine is creating interest amongst local contractors.

The two 100-C Bucyrus shovels on the Halifax Terminals are tearing out the solid rock and it is expected that some records will be made as soon as the work is thoroughly organized.

Notes from Vancouver

R. K. Payne is running the new 70-C Bucyrus electric shovel for the Granite Quarries, Limited, Vancouver, B. C. This shovel is operating in blasted granite. Payne says she is a "peach". H. Delaney is craning.

Henry, McFee & McDonald, who secured the million dollar contract for the new government wharf, Vancouver, B. C., are reported to have sub-let the dredging to the Pacific Dredging Co. There is approximately 300,000 yards of material to be removed, a large percentage of which is rock. They have equipment ready to start on this work immediately.

Toronto—G. P. McEnaneys is operating an 85-C shovel for the Canadian Pacific Ry. near here. He can be addressed at 63 Aziel St.

Edmonton, Alta.—Although several portions of the G. T. P. road, under construction, have still to be completed, there is every prospect that steel will be laid as far as Fort George by January 1st. At mile 226, there is approximately 400,000 feet of earth and rock to be removed and a large fill-in made; but with a seventy-ton steam shovel at work, this should be completed before the track-laying crews arrive. These are expected in about three months.

Saskatoon, Sask.—The Canadian Pacific railway is contemplating the building of a direct line from Calgary to this city which will make the second direct line of communication between the two cities. The Grand Trunk Pacific has already chosen its right-of-way into the city.

Winnipeg, Man.—Mr. George Bury, vice-president of the C. P. R., has stated that the program mapped out by the company for 1913 will be completed to the last detail, and that all the grading and steel work planned to be done will be finished this year. Concerning the double tracking, he said that more of it would be in operation before the close of the year.

Edmonton, Alta.—It was stated by Sir William Mackenzie on his return trip from inspecting the western progress of the C. N. R., that construction was now 74 miles beyond the British

Columbia border, and that the company hoped to have the road to the coast completed by the end of 1914. He added that 300 miles of branch lines have been laid through the prairie provinces this year, and that, taken in all, the C. N. R. has laid 840 miles of new track since the beginning of the year.

Winnipeg, Man.—The Greater Winnipeg Water District have recently issued a special notice to contractors that tenders will be invited early in the year 1914 for the construction of works necessary for the delivery of water from Shoal Lake to the Greater Winnipeg Water District. The following is a brief description of the proposed works:

1. A dyke and channel for the diversion of the Falcon river into Snowshoe Bay.
2. 85 miles concrete aqueduct.
3. 10 miles pipe line (probably 1916 work).
4. 900 lineal feet tunnel under Red river.
5. 85 miles of construction railway.
6. Telephone line.
7. Clearing and ditching.

The fall season of the year affords the best opportunity for inspection of proposed route of the aqueduct, and it is recommended that contractors having a view to tendering on the work should send their inspectors over the line at as early a date as possible.

Particulars as to estimated cost of the work and map of approximate location and profile of aqueduct may be obtained from M. Peterson, the acting secretary of the Administration board, Greater Winnipeg Water District, City Hall, Winnipeg.

Colorado

Denver—The United Yampa Collieries Co., and the Colorado Wyoming & Northern R. R. Co., are reported incorporated in Colorado. The first named will develop large coal properties in Route county, Colorado, one of the richest counties in the intermountain section. Metals and coal are in abundance and land for agricultural purposes are not surpassed by any section anywhere. All will be greatly benefited by the railroad which will be built from Craig, Colo. a point on the Moffat road to Rawlins, Wyoming, 110 miles. This will serve as a feeder for both the Moffat road and the Union Pacific and the development which will follow will be of great importance to the state as a whole. J. C. Buck and Geo. W. Bowen of Denver, Colo. are said to be interested.

Florida

Miami—Sealed proposals will be received until twelve o'clock noon of Monday, the tenth (10th) day of November, 1913, at the office of the secretary of the Everglades Sugar & Land Company, Miami, Florida, for the construction of approximately twenty-two (22) miles of drainage canals and twenty-seven and one-half (27½) miles of dikes.

Each bidder must make a personal examination of the territory in which the proposed work is located and of the character of the materials to be excavated.

All bids must be made upon blank forms which may be obtained at the company's office and must be plainly marked "Proposal for constructing drainage canals and dikes".

Each bid shall be accompanied by a certified check for the sum of $6,000, payable to the Everglades Sugar & Land Company, said check to be returned to the bidder unless he fails to execute the contract, should it be awarded to him.

All bids will be compared on the basis of the engineer's estimate of quantities of work to be done which is as follows:

(a) 1,038,000 cubic yards earth excavated and placed in spoil banks.
(b) 792,000 cubic yards earth excavated and placed in dikes.
(c) 215,000 cubic yards rock excavated and placed in spoil banks and dikes.
(d) Twenty-seven and one-half miles muck trench excavated and back filled.

These estimates are approximate only and the Everglades Sugar & Land Company expressly reserves the right of increasing or diminishing the same as may be deemed necessary by its engineer.

Information relative to the work may be obtained at the office of the chief engineer for the Everglades Sugar & Land Company, Miami, Florida, where plans, profiles, specifications, bidding sheets and instructions to bidders may be procured on and after October 11th, 1913. A charge of $5.00 will be made for each set of plans and specifications.

The Everglades Sugar & Land Company reserves the right to reject any or all bids.

W. J. Kackley, is chief engineer and V. W. Helm, president.

Pensacola—Jas. T. McCarthy & Co., Pensacola, Fla., have been awarded a grading contract by the Gulf, Florida & Alabama R. R., for the line from Broughton, Ala., to Pine Hill, a distance of 50 miles. The grading contract which must be finished by August 1, represents 1,500,000 yards of excavation. McCarthy & Co., will make headquarters in Pensacola. They should be working within 30 days, team outfits and station men to cover the rest of the work up to the river. In conjunction with this the road contemplates letting additional contracts to other parties for masonry work and steel construction in the bridge over the Alabama river. In the next 30 days the road will be letting contracts for the necessary ties and rails to be used on the 50-mile extension to the Southern railroad.

Georgia

Construction work is under way on 20 miles of railroad on the Blue Ridge mountain for the Byrd Mathews Lumber Co. About 75 per cent of the excavation is solid rock. The company is doing its own construction. Mike Harvey, Helen, Ga., is engineer.

Illinois

Cairo—Steam shovel men all over the country will learn with deep regret of the death of Harry Swanson. His loss was very unexpected. A few weeks ago he left Servia, Mo. where he has been with the Fred R. Jones Company and was apparently in excellent health. He was taken sick on his way to Cairo and died in the hospital here four days later from Brights' disease.

He leaves a widow and one small child, a girl. Mr. Swanson has run shovels for over twenty years; he was known by contractors from coast to coast as a splendid shovel runner, and by his friends as a fine type of a gentleman.

East St. Louis—R. L. Rogers is superintendent of the Callahan Construction Company, who are engaged on the L. & N. double track work near here.

Bartonville—Edward Rath is operating a Bucyrus shovel for Winston Brothers Company here.

Chicago—G. W. Trembley is running, Theodore Sauerwein craning, and Henry Roher firing a 45-C Bucyrus shovel for John W. Farley on his Albany avenue sewer contract. The Little Giant Vulcan on the same job is being operated by Mike Steinback and craned by Carl Wilkerson.

Edwardsville—Contract for work in county ditch drainage and levee district, 125,000 cubic yards was awarded on October 1, 1913, to Indiana Dredging Company, Royal Centre, Ind. Other bidders were: Lewis & Davis, Champaign, Ill.; A. O. Brown & Co., E. St. Louis, Ill.; S. R. H. Robinson & Son Contracting Co., St. Louis, Mo.; Sheppard & Morgan of Edwardsville, Ill., are the engineers.

Mound City—C. T. Bondurant, of Hickman, Kentucky, has some levee work near Mound City, Illinois, to let.

Mattoon—The Illinois Central R. R. will start within a few days on the depression of its tracks at Mattoon, Ill., so as to pass under the Big Four R. R. It will take about a year to complete the work. J. D. Lynch, Monmouth, Ill., has been awarded the contract for the grading.

Iowa

Marshalltown—Contract awarded R. A. Elzy, Marshalltown, Ia., for grading for an extension at Waterloo, Cedar Falls & Northern railway, from Urbana to Center Point, 5½ miles. Contract for bridging and culverts was let to Gould Construction company, Davenport, Ia. Work includes about 100,000 cubic yards pay material and some 300 feet creosoted ballasted trestles in extension. With completion of line to Center Point the Waterloo, Cedar Falls & Northern railway will have built 26 miles this year.

Indiana

Lafayette—W. R. Ewing and Arthur O. Brockenbrough, Lafayette, Ind. have been awarded the contract at 9½ cts. for 79,824 cubic yards of excavation for the Pond Settlement drainage district. Bids were opened October 10, at Shawneetown, Ill.

Kansas

Notes from Pittsburg

By W. S. Russell

The fine weather this month has stimulated business and the coal trade is in a satisfactory condition with fine prospects for a heavy winter's business.

Prices hold the same as last month, as follows: Lump $2.25, Nut $2.00, Slack $1.35, Mine run $1.75. F. O. B. cars at the mines.

We understand Jackson & Walker, of Wichita, Kans. are ready to let another contract for stripping and mining Santa Fe railroad coal, near Frontenac, Kansas, about six miles north of Pittsburg.

The 175-B Bucyrus steam shovel purchased by the Nesch Coal Co. for stripping coal for the Santa Fe railroad at Frontenac has been installed and will commence digging this week. A. A. Hammil is superintendent for the Nesch Coal Co. and will have charge of the plant. E. P. Hayward, erecting engineer for the Bucyrus Company, will go to Macomb, Ill. to install a 150-B Bucyrus stripping steam shovel recently sold to the W. S. Dickey Clay Mfg. Co.

The Ellsworth-Klaner Company expect to finish stripping their present field at Midway in a month or six weeks and will then move their Marion steam shovel to another field nearby where they have several years' work stripping for the Pittsburg-Midway Coal Co.

The Pierce Coal Co., who are now stripping an extensive field about three miles north of Mulberry, have their plant in full operation and are shipping about 200 tons of coal per day.

There are several parties investigating the coal stripping business in the Kansas field, and the prospects are that there will be a number of new plants put in next year.

There are good openings for parties having means, who may wish to engage in coal stripping; which is a very profitable business in the Pittsburg district. We know of several good fields of strip coal that may be secured either by purchase or lease.

We also know parties owning land who are looking for parties with means to join them in the coal stripping business.

The cost of a plant, including steam shovel, cars, track, locomotive, tipple with shaker screens, pumps, pipe, etc. will vary from $30,000.00 to $50,000.00 part of which may be purchased on several months' time. Communications may be addressed to the Pittsburg Machinery Company, Stilwell hotel, Pittsburg, Kansas.

W. S. Russell, southwestern representative of the Bucyrus Company, closed a contract last week with the W. S. Dickey Clay Mfg. Co. at Kansas City, for one of their 150-B revolving steam shovels which will be installed at the Dickey Company's plant at Macomb, Ill. This shovel will be used to strip the overburden from a bed of fire clay averaging nine feet thick, and will effect a great saving over the present method. The stripping will run from 12 feet to 22 feet deep. Shipment of this shovel is being made from the works at South Milwaukee, Wis.

E. J. White and C. D. Smith of the firm of Smith, Scott & White, coal stripping contractors, have returned from an extended trip to the northwest, including Portland, Seattle and Vancouver, and report having had a pleasant time.

We met Carl Cockrill, of the Besse, Cockrill Coal Co., on Broadway the other day. He said they were getting along fine stripping coal near Weir city and were loading coal to good advantage with their small revolving steam shovel.

The Bucyrus Company are now building a revolving steam shovel for loading coal, that will have some special features adapting it to the purpose. It will weigh about 28 tons mounted on traction wheels and have a 1¼ yard dipper.

O. S. Hubert, manager of the Cherokee-Girard Coal Co., was in town one day last week.

E. D. Packard, of the Packard-McWilliams Coal Co., shook hands with us the other day. His firm are stripping coal at Fuller, Kansas.

Frank Pierce, Sr. and F. W. Pierce, of the Pierce Coal Company, Mulberry, Kans., were guests at the Stilwell hotel one day last week.

The Pittsburg Machinery Co., John Frain manager, are doing a nice business in mining machinery and supplies. They have just received a stock of repair parts for Bucyrus coal stripping steam shovels, which will be a great convenience for users of these shovels.

Pittsburg is the liveliest town of its size in Kansas and the crowds of people on the streets on Saturdays will compare with a big city.

Fuller—F. H. Gebhardt is operating a 150-B Bucyrus revolving shovel for the C. H. Markham Coal Company.

Kentucky

Winchester—W. B. Koontz is operating a 60-C Bucyrus shovel for Sturm & Dillard Company. Mr. Koontz states that they have been up against an extremely hard rock proposition but that the shovel has gone through the test successfully and has won the regard of all.

Louisville—Contract awarded Adams & Sullivan, 215 South Seventh avenue, Louisville, for two-mile spur from Lexington & Eastern R. R. main line up Potter Fork of Boone to reach coal mines opened up by Mineral Fuel Company of Letcher county.

Mr. John Dillard of Sturm & Dillard, has about completed his contract on the L. & N. cutoff between Winchester and Irvine, Ky. with the exception of the tunnel and has taken a cut amounting to 60,000 yards in addition to the original contract on which he is using his 60-C Bucyrus shovel.

Central City—Kentucky Midland Ry. has completed surveys for the construction of its proposed extension to Madisonville, Ky. M. M. Wheeler, Central City, Ky., is chief engineer.

Massachusetts

Chester—C. A. Deneen Co. are operating a 70-C Bucyrus shovel at Chester. H. D. Ross is engineer and V. R. Robertson cranesman.

Michigan

Mr. Forrest Fordham who has recently become associated with the Bucyrus Company, is at present making an extended trip through Michigan with headquarters at Detroit.

Mr. Fordham is well known by shovel men having been in the steam shovel business for the last twenty years. For the past two years he had been associated with the American Locomotive Company.

Detroit, Bay City & Western Ry. is considering the construction of a 12-mile extention from Sandusky to Peck, Mich. Surveys have been made for the line. William N. Boyd, Bay City, is chief engineer.

Minnesota

Keewatin—James O'Brien is operating, Harry A. Stone craneing, and James B. Edwards firing a model 92 Marion shovel for Butler Bros. at Bennett Mine.

Duluth—Contract for the construction of County Ditch No. 1 which requires the excavation of 591,000 cu. yds. and the clearing of 66.51 miles, has been awarded to Fredericks, Barnard & Small of Minneapolis, Minn.

Missouri

Shelbina—Shelby County R. R. has had a survey made for the construction of an extention from Shelbyville, Mo., to Leonard, Cherry Box and Novelty, Mo., a distance of about 23 miles. J. G. Houck, Shelbina, Mo. is general manager.

St. Louis and Vicinity.

By Tony Michel

Steam shovels of all kinds are making the dirt fly at Cairo, Ill. List & Gifford are busy people there. They have quite a number of Austrians on this job. They have also a few American hobos.

The Fred R. Jones Co. at Cairo have a couple of shovels busy on the Cairo Levee work. They have four gangs of Austrians and are progressing nicely. Mr. Jones was in St. Louis the past week and no doubt we will be able to report something interesting in the line of another contract in next issue.

J. G. Moore the oldest steam shovel engineer in the business just came in from Capt. Ware's job at So. Liberty, Mo. where he has run a Bucyrus shovel 2 years and 27 days without missing a single day.

He will take a needed rest at Hot Springs. Mr. Moore and wife departed for there last week.

J. V. Crawford is idle at present. He is an A.-1 engineer. Address him care Michel Labor Agency.

Capt. J. A. Ware with offices in the Houser building is expecting to be the successful bidder on some heavy steam shovel work which will be let the coming week.

Lorrimer & Gallagher are starting full blast with their track laying on the east side this week. They will put on 200 men and the Federal Boarding and Commissary Company will take care of the feeding.

They are good feeders and this fact alone should prove to be a great help to finish the work in record time.

Are you needing a steam shovel and car outfit?

Columbus S. Jones has such an outfit idle at present. If you wish to reach him quick wire Michel Labor Agency.

T. J. Howell president of the New Moon Mining Company of Duquoin, Ill. made us a pleasant call recently. They are just opening a new coal mine. They are stripping with a 45-ton Bucyrus shovel.

Mr. Howell is open at all times for a shovel proposition.

R. E. McCann is loading "some stone" at his quarry in southern Missouri.

Mr. McCann is tired of the semi-daily pay days necessary to work hobo and negro laborers and we furnished him a bunch of Austrians who are doing excellent work.

Labor is plentifull around St. Louis now. All kinds. All nationalities, do you want any? today, tomorrow, anytime? write or wire Tony Michel, 9 So. 9th. street.

The masonary and bridge work on the New Orleans T. & M. Ry. was awarded to J. W. McMurry Contracting Co. of Kansas City.

Work to be commenced at once. This firm will open temporary offices at Baton Rouge, La.

J. W. McMurray has purchased a stone quarry on the Mississippi River just above Alton, Ill. for the purpose of securing stone rip rap for his revetment and river work above the chain of rocks.

J. W. Beard the leading labor agent of Indianapolis rushed in and right out again one eve last week. Beard is busy placing several hundred foreigners on the Big Four throughout Illinois.

J. V. Swift, Junior member of Rust & Swift spent a day with us. He says his firm will be busy the greater part of this winter and resume again when weather permits in spring on the various rip rap and dike jobs on the upper Mississippi river.

Major W. L. Killebrew have 150 acres of Willow cutting and land clearing in southern Missouri. He reports good progress and loads his brush and willows with steam derrick.

M. P. Thornton an all around track foreman is idle just now. Anyone needing the services of such a man write him to 3734 Louisiana Avenue, St. Louis.

Nevada

Wadsworth—Philip Tuckett, is operating and Homer Ward craning a 95-ton Bucyrus shovel for the Southern Pacific R. R. at the Astor Gravel Pit about 60 miles from Wadsworth.

North Carolina

Palmersville—E. J. Moxley is operating a 70-C Bucyrus shovel for B. H. Hardaway at Whitney. He is operating his machine in rock and speaks very highly of the good service that it is giving.

North Dakota

Northern Pacific Ry. has awarded the contract to Roberts Bros., 17 North La Salle St., Chicago, Ill., for the construction of 71 miles of line west of Stanton, N. D., on the Knife river extension. The contract for the necessary bridges has been let to A. B. Cooke & Co., Helena, Montana.

New York

Buffalo—The Great Lakes Dredge & Dock Company of Buffalo was successful bidder for the government contract for improving the Hudson river between Albany and Troy. The bid submitted to Colonel Black, United States engineer at New York, was for $1,100,000. It will take about 3 years to complete the work. The dredging company will begin operations immediately.

Oregon

Notes from Portland.

Boomer & Hughes are well started on a contract which they have from the Spokane, Portland & Seattle Ry. for filling a slough in Sullivan's Gulch in the city limits of Portland. They are using on this work a 65 ton and a 45 ton Bucyrus.

One of the interesting features of the contract is the fact that the slough seems to be without bottom, and when a certain

amount of pressure has accumulated due to the filling in, the bottom suddenly gives way and the whole embankment will drop from 15 to 20 feet, raising small islands from 50 to 100 feet from the toe of the fill. Mr. Burpee, superintendent of this work, figures that the material which he has filled in this slough has now reached a depth of 112 feet.

One of the difficult problems came about through the fact that there are two bridges crossing the slough having their piers in the slough on pile foundations. In order that these foundations might not be thrown out of line due to the slipping of the material in the fills it is found necessary to make the fill about the piers by wheelbarrow, getting an even pressure around each pier.

Even under these difficult conditions their shovels have been averaging about 1000 yards each for one shift.

The Twohy Brothers Co., who have recently secured a large bridge filling contract from the Oregon-Washington Ry. & Nav. Co., are getting their camps in shape and will start operations on this work the first of November. They will use a 100-C Bucyrus and will serve the shovel with three 15 car trains of 16-yard Kilbourne & Jacobs cars.

The special feature of this fill is its size, there being about 2,500,000 yards necessary to make the complete fill.

Guthrie & McDougal, Lewis Building, Portland, have been awarded the contract for 41 miles of line from Doty to Maytown, for the Puget Sound & Willapa Harbor Ry., Chicago, Milwaukee & St. Paul Ry. line.

Pennsylvania

Homer City—F. A. Edwards is craning a 70 ton Bucyrus shovel for the Miller Construction Co. here.

Pittsburgh—The Swanton Construction Co., Pittsburgh, has been awarded contract for grading for the line of the Pittsburgh, Harmony, Butler & New Castle Ry. (electric), from Ellwood City to Beaver. Work is to be started at once, and it is hoped to have the line in operation by next summer. Harry Etheridge, Eidenau, Pa., is superintendent of the railway.

It is announced that the Pittsburgh & Lake Erie Railroad Company will immediately begin the double tracking of the New Castle branch between Ferrona and New Castle, Pa. This road is owned by the Sharon Railroad Company, of which president Underwood of the Erie is a director, and leased to the Erie for a period of 999 years. The Erie subleased it to the Pittsburgh & Lake Erie for a period of 99 years.

South Dakota

Contract awarded by Dakota Eastern Railroad Co., for construction of 32 miles of line in South Dakota to Struchen-Nelson Construction Co., at $480,000.

Utah

Salt Lake City and Vicinity.

By H. N. Steinbarger

Clarence L. Crandle of the Reynolds Ely Construction Co., of Springfield, Utah was recently in Salt Lake. He reports fine progress on their government work at Grand Junction, Colo. on the Grand Valley project of the Reclamation Service. They have the entire job covered with sub contractors except a small portion which they are doing themselves with their little Model 20 Marion. They are now looking for a nice big slice of work for their two 60-C Bucyrus shovel outfits. We surely hope they will soon succeed in finding suitable work.

The Reynolds Ely Construction Co., have recently taken a nice piece of work on the Salt Lake & Utah R.R. new interurban line near Lihi, Utah. Vosburgh & Carlson, concrete contractors of Denver are doing the concrete included in an undergrade and bridge under the D. & R. G. Ry, and which is a part of the Reynolds Ely Co., contract.

It is reported that the Salt Lake & Utah R.R. Co., has started a corps of engineers on the final survey between Provo, Utah and Payson, Utah for the Salt Lake to Payson interurban line. It is believed that the company will start construction on to Payson as soon as the road is completed to Provo, which is expected will be early next year. Track laying will be started at an early date and pushed rapidly as possible during the cold weather which will soon prevail. This line will open up some new territory and make possible the shipment of fruit to the Salt Lake City markets and at a rate that will be attractive to the raisers throughout. A. J. Orem & Co., of Salt Lake City are back of this proposition and we believe this assures complete success.

We are just advised that Mike, Robert and Charlie Dooling all of Dooling Brothers Railroad Contractors were called to Kansas City Mo. in October on account of the fatal illness of their mother whose home has been there for a number of years.

We want to extend through these columns our utmost sympathy in this the greatest bereavement they will ever experience. Her health has been failing for several months and while her death was not wholly unexpected yet the loss is just as great and we know is felt keenly by all, and will leave a void in their lives that can never be filled.

D. S. Gerow and Mrs. Gerow were looking over the sights of Salt Lake City recently, having run in from Helper, Utah near where Mr. Gerow has a large contract. They of course had to do some shopping, Mrs. Gerow as is the case with all ladies being much interested in the latest things feminine. D. S. however bought only the usual and very necessary supplies that every camp requires and also made arrangements for employing about fifteen to twenty more men on his work.

Some little time ago the L. R. Wattis Co., of Salt Lake City took a 60,000 yard contract from the Castle Gate Coal Co., of Salt Lake for grading at the mouth of Panther Canyon, near Castle Gate, Utah, for a large coal tipple. They installed their Model 61 Marion shovel, two Vulcan dinkies and Western dump cars in record time and Mr. Wattis now reports the work nearly complete. They will no doubt have another job lined up for this outfit as they seem to have the happy faculty of keeping all of their equipment busy all of the time.

Late in September Dooling Bros. shipped their string of teams to Preston, Idaho, where they will be busy for the next sixty days. The outfit consists of about 70 head of the best looking mules we have seen in a long time. The entire shipment was stopped at Ogden, Utah for two days to be inspected by the Idaho authorities but we are glad to say that not one of the string was held. The work is under the Phoenix Construction Co., of Salt Lake City a subsidiary of the Utah Power & Light Co., Dooling Bros. also sold their 70 ton Vulcan shovel to the Phoenix Company and reports coming from the field show that it is making a good record on the work. Reports from the Tucker, Utah D. & R. G. work now about complete show that this Vulcan made a record for yardage that no other shovel on the line reached. Evidently it has a long life and a busy one before it. Charlie Dooling and E. L. Brannon will be located on this work.

The Phoenix Construction Co., are doing a tremendous amount of work on one of the largest power plant projects in this part of the counrty. They now have five steam shovels at work as well as about fifteen concrete mixers all on reservoir and dam constructions. Charlie Campbell formerly of Dooling Bros. and Kilpatrick Bros. has accepted a responsible position with the Phoenix. He seems very well pleased with his new duties. Salt Lake City was formerly his home and he seems right happy to be back in the familiar atmosphere again. From all indications some of his time in the future will be occupied with social duties. That's as it should be for Charlie is young and eligible and they say that there is a dearth of eligible men in Salt Lake.

Of all the shovels employed at Tucker, Utah on the D. & R. G. Ry new detour line during the past six months there remain only five at work. This job is now about 90% complete and

another month will see the finish of the grade. As the railroad company is following closely on the heels of the contractors with track laying it is possible that trains will be running by the middle of November or first of December next. All contractors made a good record on the work although some of the hardest conditions to combat in this part of the country were encountered.

Hamilton & Gleason of Denver, Colo and more recently of Tucker, Utah where they completed four miles of the grade on the D. & R. G. detour line have just moved on to a new job at Thistle, Utah. The work consists of about three hundred thousand yards of second track work for the D. & R. G. Ry. from Thistle west towards Salt Lake City. They made a splendid record in moving their outfit and camp to the new location, accomplishing the work and throwing dirt in two weeks time. Their outfit consists of two 70-C Bucyrus shovels, five locomotives, about 60 four yard Western cars and a large team outfit. This we believe is a mighty good record, but then they are making records on all of their contracts. We recall that they averaged about 800 four yard cars per day of ten hours for an entire contract at Wellington, Colo. and on several days made 900 and 950 cars per day. The big record for that job was 1059 four yard cars in eleven hours. Two more trains of twelve cars each could have been loaded but for the fact that one of the locomotives jumped the track causing them to stop for the day. It was the only accident of any sort during the period. They employed on this run one 70-C Bucyrus shovel, two twelve car trains. We believe this one of the best if not the best run made for some time with a similiar outfit.

Virginia

Jarratt—Joseph Sands Contracting Co., of Roanoke, Va., are making good progress with fifty miles of double track for the Atlantic Coast Line. They expect to finish by December first. A. W. Clark is superintendent; J. B. Bishop is walking boss; J. W. Murray is operating; Bean Miller, craning and Louis Powers firing their 70-C Bucyrus shovel.

Charlottsville—Rinehart & Dennis, Co., Charlottesville, Va., have been awarded the contract for the 5-mile extension of the Buckhannon & Northern R. R., from Catawba in Fairmont. The contract amounts to approximately $1,000,000, and consists of about 600,000 cubic yards of excavation, a big portion of which is solid rock, 1,200 feet tunnel, and 30,000 yards of concrete, including a bridge over the Monongahela river. The work is to be started at once and is situated between Morgantown and Fairmont, W. Va. The contractor's local address will be Fairmont, W. Va.

Washington

Puget Sound & Willapa Harbor R.R. have asked for bids for the construction of a section of its proposed line from Mayton, Wash., through Centralia to Chehalis, Wash., a distance of about 41 miles. R. A. Snodgrass, Seattle, Wash., is resident engineer.

West Virginia

Surveys have been completed for the new cut-off line which the Baltimore & Ohio Railroad will build to establish a new connection between the Wheeling division and the Monongahela river line of the Monongah division in West Virgina, facilitating the movement of through traffic and the handling of coal from the extensive coal fields on that section of the system. The new line will be known as the Monongah cut-off. It will be built from Kingmont, on the Wheeling division to Gaston Junction, on the Monongahela line a distance of three miles.

Bud—J. B. Rosazza is operating a 70-C Bucyrus shovel for the Vaughan Construction Co., near here.

Foreign

San Domingo—It is reported that several capitalists of New York, N. Y., are considering the construction of about 180 miles of railroad in San Domingo, at an estimated cost of $20,000,000. T. J. Sullivan, Springfield, Mass., it is reported will be in charge of the work.

POSITIONS WANTED.

STEAM SHOVEL ENGINEER

Ten years' experience operating all makes of shovels, draglines and dredges. Prefer Bucyrus full circle machine. Strictly temperate. Prefer position where family may be near work.
F. L. JONES
Care Excavating Engineer P. O. Box 607, Milwaukee, Wis.

ASS'T. SUP'T. OR GEN'L. FOREMAN

Steam Shovel Work Preferred—8 years experience, with best recommendations in Railroad, Dam, Foundation and Heavy Concrete—Practical Civil and Mechanical Engineer capable of operating in a pinch any class of machine used in construction. Reputation of hustler under all conditions. WILLSON B. JONES, Care of Excavating Engineer, P. O. Box 607, Milwaukee, Wis.

CRANESMAN OR FIREMAN

Bucyrus preferred—4 years experience. Will come on short notice. JOHN W. LEWIS, care of Excavating Engineer.

STRIP COAL LAND WANTED

Parties having from 80 to 640 acres of strip coal land for sale or lease, please write or come and see the
PITTSBURG MACHINERY COMPANY
711 Broadway PITTSBURG, KANSAS

BIDS WANTED

on stripping and loading coal in railroad cars. Both large and small propositions. Average stripping about eighteen feet. Work located in Alabama. Address—
Strip. care of Excavating Engineer, P. O. Box 607, Milwaukee, Wis.

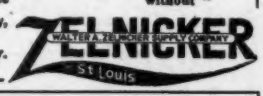
STEAM SHOVEL FOR SALE

Little Giant Vulcan—1¼ yard dipper. Excellent condition.
EXCAVATING ENGINEER,
P. O. Box 607. Milwaukee, Wis.

HOISTING ENGINE BARGAINS

2	8½ x 12	Double	Cylinder	Double	Drum	Lidgerwood,	with boiler.
3	8½ x 10	"	"	"	"	"	"
1	6½ x 8	"	"	"	"	"	"
1	6 x 6	"	"	Single	"	"	without "

Write us for anything in Machinery, Equipment, Rails, etc.
September 84-page bulletin now ready.



For Sale
Second-Hand Shovels

1—100C Standard Bucyrus Shovel—2½ yd. dipper.
1 Giant D Special 60-Ton Vulcan Shovel.
1 Giant D 50-Ton Vulcan Shovel.

Bucyrus Company
South Milwaukee Wisconsin

Contractors' Machinery and Equipment

Thoroughly Repaired and Ready for Immediate Shipment

Steam Shovels

1 BUCYRUS 100 TON
1 ATLANTIC 90 TON
*2 MARION 90 TON
2 MARION MODEL 60
1 BUCYRUS 70 TON
3 ATLANTIC 70 TON
1 ATLANTIC 30 TON
BUCYRUS REVOLVING

Heavy Locomotives

6 40 Ton Penna. R. R. 4 Wheel Switchers
*8 40 Ton Baldwin 4 Wheel Switchers
3 55 Ton Penna. R. R. 6 Wheel Switchers
5 50 Ton 18x24 6 Wheel Switchers
4 55 Ton 18x24 TEN WHEEL
5 65 Ton 20x24 CONSOLIDATION
2 75 Ton 20x28 MOGUL

Saddle Tank Locomotives

3 11x16 AMERICAN, 36 IN. GAUGE
1 12x18 AMERIC'N, STAND'RD "
*1 13x18 PORTER, STANDARD GAUGE
*1 14x22 AMERICAN, " "
*1 16x24 PORTER, " "
*3 16x24 AMERICAN, " "

Miscellaneous

AIR COMPRESSORS
WESTERN DUMP CARS
HOISTING ENGINES and DERRICKS
BALLAST UNLOADER PLOWS
SPREADER CARS
LOCOMOTIVE CRANES, ETC.

*Built in 1912.

GENERAL EQUIPMENT COMPANY

30 Church Street, New York City

Steam Shovel Boilers For Sale

New

2—42"x8' Vertical Water Tube Boilers.
1—42"x7'6" " " " "
9—48"x8'0" " " " "
1—60"x8'0" " Submerged " "
1—54"x20' Locomotive Type
1—54"x9'0" Vertical Boiler.

These boilers are surplus stock which cannot be used on new design shovels now being built. They have never been used, and are offered at a sacrifice.

Second Hand

1—54"x20' Locomotive Type Boiler.
1—50"x8'9" Vertical Type Boiler.
1—49"x8'9" Vertical Type Boiler.

All in excellent condition. The last two were used less than 60 days.

BUCYRUS COMPANY

P. O. Box S. South Milwaukee, Wis.

Must Be Moved Quickly

1—Marion Model No. 35, Shop No. 2305, 1-yard dipper. Shovel used only short time. Cash Price $3500.00 Pittsburg.

(The above mounted on Standard Gauge R. R. Trucks.)

Contractors' Machinery & Supply Co. Steuben & Carson Sts. Pittsburgh, Pa.

For Sale or Rent

2 50 H. P. J. I. Case T. M. Co.'s hauling engines, equipped with municipal wheels, large water tanks and coal bunkers.

1 25 H. P. Reeves traction engine, with extra width drive wheels.

1 National Elevating Grader.

1 26 ton Little Giant traction Steam Shovel, with 1 yd. dipper.

14 Troy Reversible 4 yd. hauling wagons.

This outfit has only been used on one job at East Moline, Ill. The hauling outfit has not been used to exceed thirty days, and all in new condition and can be inspected here.

JOHN KLEHM & SONS

MOLINE :: :: ILLINOIS

ATWOOD'S EMPLOYMENT AGENCY

MRS. S. J. ATWOOD, Proprietor Established 1886

LABORERS

for

Railroad Companies
and Contractors
OUR SPECIALTY

Also a Dept. for
FOREMEN--ENGINEERS--CARPENTERS
and all kinds of skilled labor
for construction work

12 State Street, New York

LET ME FURNISH YOUR LABOR

Bell Phone Olive 1086

17 Years Experience

A. J. MICHEL

9 South Ninth Street. ST. LOUIS, MO.

"TIGER" STEEL BUNKS

Never break down like a wooden cot.
—They are built to last.

Can be shipped without packing.
—No danger of injury in shipment.

The spring will never sag.

Absolutely bug proof.

Your Men Need Rest

If men sleep in clean, sanitary bunks where they rest comfortably and are never bothered by bugs—they are in better condition for a hard day's work, aren't they? Contractors, think this over.

Built in all sizes, either double or single deck.

Write for descriptive circular and prices.

AGENCIES: Broderick & Bascom Loggers' Supply Co., Seattle, Wash. Stewart Bros. Co., Portland, Ore. Western Equipment Co., San Francisco, Cal. Clapp, Norstrom & Riley, Chicago, Ill., and St. Paul, Minn.

Haggard & Marcusson Co.
1113 West 37th St. Chicago, U. S. A.

What Paint for Your Machinery?

You know that machinery must be painted, that it must have a protective coating, and that quite often the paint that is on the machinery when you buy it is of an inferior grade that cannot withstand vibration and constant exposure. It cracks, it peels, it falls off in big chunks leaving the naked metal to rust and corrode.

H. & M. Machinery Paint is made by a special formula, producing a protective coating that will successfully combat the wear and tear of vibration and exposure.

And with our sixty-two years of paint making experience we are able to manufacture a product that will stand the strain and give splendid service for years.

"Quality goes in before the name goes on."

Heath & Milligan Mfg. Co.

PAINT AND COLOR MAKERS

Chicago ▣ U. S. A.

For Any Kind of Service—VULCANS

The two forward locomotives are six-wheel switchers built for the Merritt & Gilbert Co., Railroad Contractors, Pierce, Fla. The loco in the rear is 14"x20" saddle-tank built for the Olympic Portland Cement Co., Bellingham, Wash.

VULCAN Locomotives

being made in standard and other practical gauge are adaptable to all kinds of work, industrial, contracting, etc. All parts are interchangeable, making it easy to order new parts, should any become worn in years of hard service. Mail the coupon for a free copy of our book on locomotives.

VULCAN IRON WORKS
1748 Main Street WILKES-BARRE, PA.

NEW YORK OFFICE, 50 Church Street
CHICAGO OFFICE, 913 McCormick Bldg.

"A Locomotive a Day"

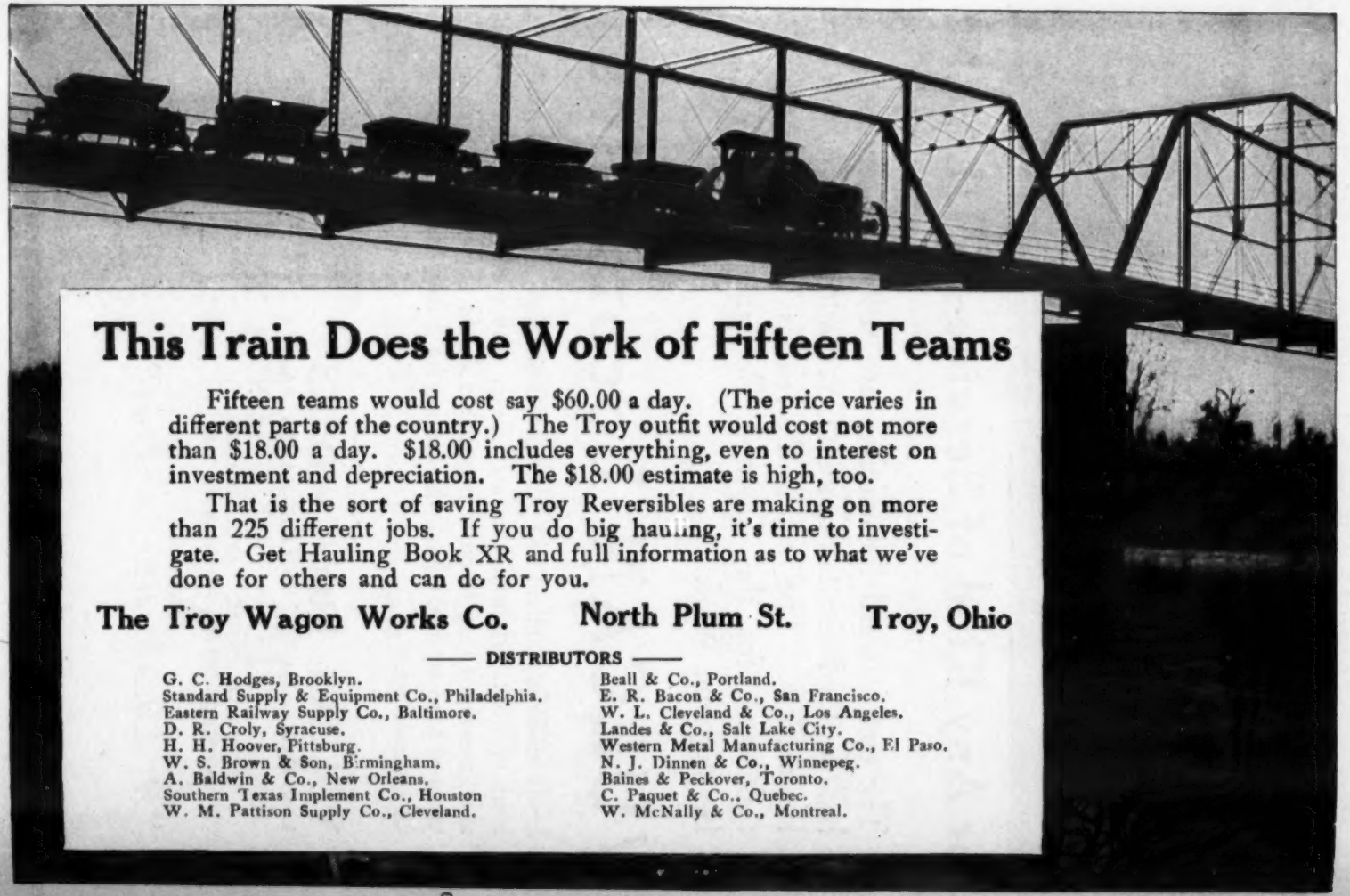
Gentlemen:—Send me complete information and catalog.

Name .....

Business .....

Address .....

.....



This Train Does the Work of Fifteen Teams

Fifteen teams would cost say $60.00 a day. (The price varies in different parts of the country.) The Troy outfit would cost not more than $18.00 a day. $18.00 includes everything, even to interest on investment and depreciation. The $18.00 estimate is high, too.

That is the sort of saving Troy Reversibles are making on more than 225 different jobs. If you do big hauling, it's time to investigate. Get Hauling Book XR and full information as to what we've done for others and can do for you.

The Troy Wagon Works Co. North Plum St. Troy, Ohio

DISTRIBUTORS

G. C. Hodges, Brooklyn.
Standard Supply & Equipment Co., Philadelphia.
Eastern Railway Supply Co., Baltimore.
D. R. Croly, Syracuse.
H. H. Hoover, Pittsburg.
W. S. Brown & Son, Birmingham.
A. Baldwin & Co., New Orleans.
Southern Texas Implement Co., Houston
W. M. Pattison Supply Co., Cleveland.
Beall & Co., Portland.
E. R. Bacon & Co., San Francisco.
W. L. Cleveland & Co., Los Angeles.
Landes & Co., Salt Lake City.
Western Metal Manufacturing Co., El Paso.
N. J. Dinnen & Co., Winnepeg.
Baines & Peckover, Toronto.
C. Paquet & Co., Quebec.
W. McNally & Co., Montreal.

ROEBLING

WIRE ROPE

The wires in Roebling Wire Rope are rolled and drawn from carefully selected metals and are shown by thorough tests to be strong, pliable and uniform in quality. These wires are stranded into rope in accordance with designs and shop methods developed from the experience of many years.

John A. Roebling's Sons Co.

165 West Lake St., CHICAGO TRENTON, N. J.

Steam Shovel Hand Book

Published by the Bucyrus Company

This Book is the only publication written from the practical viewpoint and should be in the hands of every contractor and operator.

CONTENTS

Chapter 1—Nature of the Problem.
" 2—General Conditions and Formulas.
" 3—Field Conditions.
" 4—Estimating.
" 5—Work in Sand and Gravel.
" 6—Work in Earth and Glacial Drift.
" 7—Work in Clay.
" 8—Work in Iron Ore.
" 9—Work in Rock.
" 10—Directions for Moving Shovel.

Bound in Cloth—370 Pages, 4" x 6½"

Price, $1.50

THE EXCAVATING ENGINEER PUBLISHING CO.

267 National Ave., Milwaukee, Wisconsin

Found at Last

The Perfect Steam Shovel Chain

"HERCULES SOLID WELD"

Every Link as Strong as the Solid Bar

Cannot come apart at welds. Made from tough high grade hammered iron. The chain that lasts until entirely worn out. No delays from broken chain.

It is a marvel in rock work

Made only by

THE COLUMBUS CHAIN COMPANY

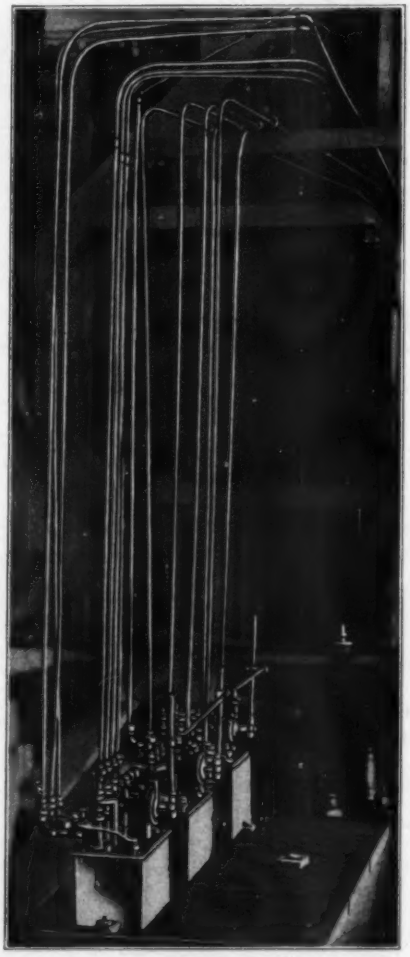
Lebanon, Pa. Columbus, Ohio

Address all communications to COLUMBUS, OHIO

Force Feed Lubricating Pumps

Supplying Fourteen Steam Cylinders

The Three Pumps Shown Driven From One Shaft



REDUCE OIL BILLS and Wear and Tear of Valves and Cylinders

We have them in operation with seventy feeds from one reservoir. Some prefer to have them connected as shown in the cut.

HILLS-McCANNA COMPANY

154 W. Kinzie Street CHICAGO, ILLINOIS

AGENTS—JAMES D. SCRUGGS, 22-20th STREET, BIRMINGHAM, ALA.

Southern Representatives—Hall Manufacturing Co., 94 John St., New York City
Chas. A. Claflin Co., 60 Heigh St., Boston, Mass.

ON STEAM SHOVEL WORK

it is as important to have the best locomotives as it is to have good cars and shovels.
This is why there is such a demand for

DAVENPORT LOCOMOTIVES

This illustration shows our 17x24, 47 ton 6-wheel connected locomotive with separate tender that we recommend for 12-yard service. We equip these locomotives either with or without the air-dumping arrangement, as desired.

Our engines have large free steaming boilers built to pass any inspection specified.
Several sizes carried in stock for immediate shipment.
If interested in locomotives, ask for our catalogue.

BRANCH OFFICES

Chicago, 12 & 14 So. Canal St.
St. Paul, 1308 Pioneer Bldg.
St. Louis, 654 Pierce Bldg.
New Orleans, 208 Godchaux Bldg.
New York City, 362, 50 Church St.
Seattle, 617 Western Ave.
Pittsburgh, 405 Oliver Bldg.
Montreal, 286 St. James St.
Winnipeg, 45 Canadian Life Block
Vancouver, 175 Cordova St.

DAVENPORT LOCOMOTIVE WORKS, Davenport, Iowa

MONARCH
"Whyte" Strand
WIRE ROPE
is perfection in rope manufacture

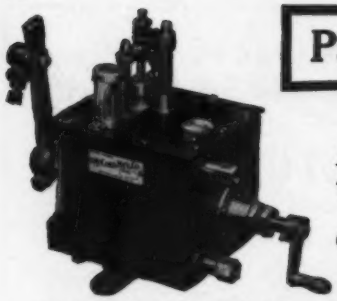
Made in our own factory, from rod to finished rope, tested for extreme strength and ductility, and guaranteed to be the best.

Will you try it?

M·O·N·A·R·C·H
WIRE—ROPE
ALWAYS ONE WHYTE STRAND

TRADE MARK REGISTERED.

MACOMBER & WHYTE ROPE COMPANY
CHICAGO, ILLINOIS KENOSHA, WISCONSIN
PORTLAND SEATTLE PITTSBURG NEW YORK



Special Steam Shovel Model

Pay For Themselves In a Short Time

In the oil they save alone, the "McCord" Force Feed Lubricator soon pays for itself. In addition it makes a marked saving in Engine Repair Bills and Usable Power.

"McCord" *Force Feed* Lubricators

start, stop and change speed with the engine regardless of temperature changes, steam pressure variations or viscosity of oil.

Besides such standard features as:—Positive Sight Feeds, Simple and Accurate Adjustment of Feeds, Durable Driving Mechanism and great Accessibility of Pumps, they have many special features of particular advantage to Steam Shovel and Dredge men.

Details of our Special Heating Apparatus given in Booklet "Y". Write for it and ask about our FREE TRIAL OFFER.

McCord Mfg. Company

New York **Detroit, Michigan** *Chicago*

No Other Lubricator Has These Features

Drain plug—under sight feed

Reversible end bearing

Auxiliary priming device

Drop forged operating lever

201

Buy the Chain That Stands the Strain

A few days ago an officer of the Taylor Chain Company visited one of the largest quarries in the middle west, where four big steam shovels were tearing away at the rock—He was greeted by the runner of the first shovel as follows:—*"Your chain has been on my shovel for 10 months, it is going yet!"* By the second:—*"You've got the strongest chain on the market for work like this!"* The third and fourth added their testimony to the fact that

TAYLOR MESABA

wears the longest and gives the greatest yardage of any chain they ever used!

THE MAN WHO PULLS THE LEVER KNOWS!

S. G. Taylor Chain Co.

7/8"-1"-1 1/8"-1 1/4"-1 3/8"-1 1/2"-1 5/8" carried in stock

641 Marquette Bldg. Chicago, Ill.

Known the World Over

The Only Water-tight Leather Sole Rubber Footwear Made

Here Is the Reason

Here Is Proof:

Rubberhide Company,
Essex Bldg.,
Boston, Mass.

Gentlemen:—

As per my last night's message you see we are short of boots again. If you could give us an immediate shipment of part of our order, we would appreciate it very much.

I can well understand why there is such a demand for your goods, as we have found them very satisfactory.

Very truly yours,
(Signed) Name On Request.

A 25% MORE-WEAR FEATURE

All Rubberhide Boots and Ezoa Shoes have malleable iron heel rims. No extra charge.

RUBBERHIDE Economy Begins Where Ordinary Rubber Boots Wear Out

Write for Catalog and Prices

Rubberhide Company, Desk E.E., Boston, Mass.

Contractors!

You Know—

STEAM SHOVEL WORK
TUNNELING
RAILROAD CONSTRUCTION
LEVEE CONSTRUCTION
CONCRETE ABUTMENTS
HEAVY CONSTRUCTION WORK

I Know—

INSURANCE and BONDING

and how to secure either for any kind of work in any part of the United States, Canada or Mexico. Don't waste time trying to do what I am paid to do for you by the largest liability companies in the world. Write for expert advice and rates.

CHARLES R. NEIDLINGER
INSURANCE AND BONDING
19 Liberty Street, New York City
— Within Five Minutes of All Head Underwriters —

Hill's Rail Clamp

AUTOMATIC IN ACTION

MODEL "K" FOR STEAM SHOVELS

has stood the test of more than five years. Not one has broken and the only repairs necessary have been a few "Grip Points"

Prices and Printed Matter On Application.

C. W. HILL
1202 Dechman Avenue, - PEORIA, ILL.

The Largest Engraving Establishment in the United States specializing in

QUALITY ENGRAVINGS

FOR

MACHINERY CATALOGUES

BUREAU OF ENGRAVING

MINNEAPOLIS

OMAHA DES MOINES

MILWAUKEE DAVENPORT

This Shows the Backbone of AMERICAN TRANSMISSION ROPE

¶ It isn't merely a stuffing—a filler. It's a sound core—the real backbone of the rope. That's why we show it.

¶ The hardest wear in Transmission Rope is caused by internal friction in and around the core. That's where rope quality is most severely tested. On the core and the inner yarns essentially depends the strength, service and life of the rope.

We develop the greatest resistance at the point of greatest wear.

¶ The core of American Transmission Rope is strengthened and fortified with especial care.

¶ In quality it is equal in every particular with the rest of the rope. Only the best Manila hemp, the most honest and skilful workmanship, frequent and conscientious testing go to the making of this core. Then, in addition, it is thoroughly treated with our special lubricant, which practically eliminates fibre wear under any conditions of arduous service. This lubricant works out through every portion of the rope, giving it pliability and protecting it against injurious external agencies. This means a long-lived rope.

¶ We would be glad to send you a sample of the rope so that you might inspect this core for yourself.

A Valuable Book or Magazine—FREE

Let us have your name and address and it will give us pleasure to mail you FREE our "Blue Book of Rope Transmission." It may help you to solve your transmission problems. It treats the subject comprehensively and contains many valuable bits of information. Let us send you, also, our magazine "Cord-Age" containing the latest news and useful pointers respecting Rope Transmission. In both of these publications you will discover many more reasons for the superiority claimed for and earned by AMERICAN TRANSMISSION ROPE.

We Ship Without Delay—on Telegram if Necessary from either point of manufacture

American Manufacturing Co.
Dep't. EE.
Brooklyn, New York City

St. Louis Cordage Mills
Dep't. EE
St. Louis, Missouri

Many of the Best Catalogs
for the Largest Manufacturers
of Machinery
in the United States
are Printed by
MEISENHEIMER PRINTING CO.
ENGRAVERS · PRINTERS · LITHOGRAPHERS · BINDERS
330 · CLINTON · ST · · MILWAUKEE · WIS.

Profitable Work for Your Steam Shovel

THE steam shovel is the largest item in the equipment of a first-class gravel plant. In very many localities, the most profitable work to which a shovel may be put is in the excavation of sand and gravel for market purposes.

There is a strong and growing demand in every locality for washed and graded sand and gravel. Concrete construction and scientific road building are increasing the demand astonishingly fast. There are few localities where there is not an assured market at prices considerably above the cost of production.

Our experience has given us a complete understanding of the requirements of the gravel business. We have designed and built upwards of 250 plants—each one a success. Each has been designed to suit peculiar local conditions—both with regard to the gravel bank and the market. It is only after actual experience with these 250 plants and a scientific study of the business that we are able to qualify as experts in the washing and screening of sand and gravel.

We shall be glad to study your proposition and to submit designs without placing you under any obligation.

Stephens-Adamson Mfg. Co.
Dept. G. AURORA, ILL.
CHICAGO NEW YORK PITTSBURGH ST. LOUIS
BOSTON LOS ANGELES VANCOUVER

The Labor Saver keeps you posted on modern methods. It gives you live up-to-date news of modern methods of handling material. Many actual photographs from the field, and brief accurate descriptions. Data of value to the engineer regarding the "S.A" of conveying machinery. A request on your letter head will bring all issues without other obligation.

One of the plants of the Joliet Sand & Gravel Co. which produces 3000 yards per day.

Industrial Locomotives

Mogul Locomotive for the Republic Iron & Steel Co.

must frequently operate under difficult conditions, and must be specially designed to suit the service.

We have had experience in building locomotives for all kinds of industrial work.

The locomotive illustrated is operating on 36 degree curves and grades of 4 per cent., and is suitable for freight or heavy switching service. It exerts a tractive force of 34600 pounds, and weighs with tender 255000 pounds.

The Baldwin Locomotive Works

PHILADELPHIA, PA., U. S. A.

BRANCH OFFICES

NEW YORK, N. Y., 50 Church Street ST. LOUIS, MO., Wright Building CHICAGO, ILL., Railway Exchange
PORTLAND, ORE., Spalding Building RICHMOND, VA., Travelers Building

IT WORKS LIKE A PAIR OF ICE TONGS

The Bates Rail Clamp

Consists of two steel Castings held by a Heavy Pin.

The wedge or key is driven ABOVE rail, NOT below base as on other clamps.

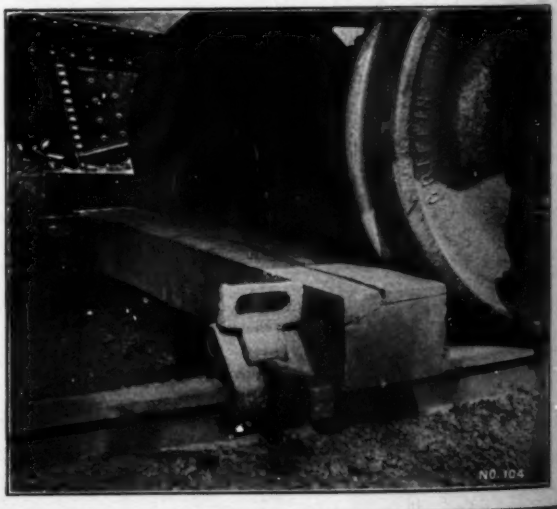
No delay or annoyance when tracks are covered with mud or water.

Can be placed anywhere without regard to position of ties.

The hooks bear under flange of rail, thus giving a secure grip on the rail at all times.

"WHEN ORDERING PLEASE GIVE SIZE OF RAIL"

SOLD BY THE



Bucyrus Company

P. O. Box S South Milwaukee, Wis.

The Jordan Spreader=2500 Laborers

Jordan Spreader operated by Walsh-Hogan Construction Co., at Forbes, Minn.

IT SPREADS BALLAST
45 Feet in Width

IT CUTS A GRADE
24 Inches Below and 17 Inches Above Track

IT OPERATES AT A COST OF
$30 to $35 a Day

Operated by one man—pneumatic control.

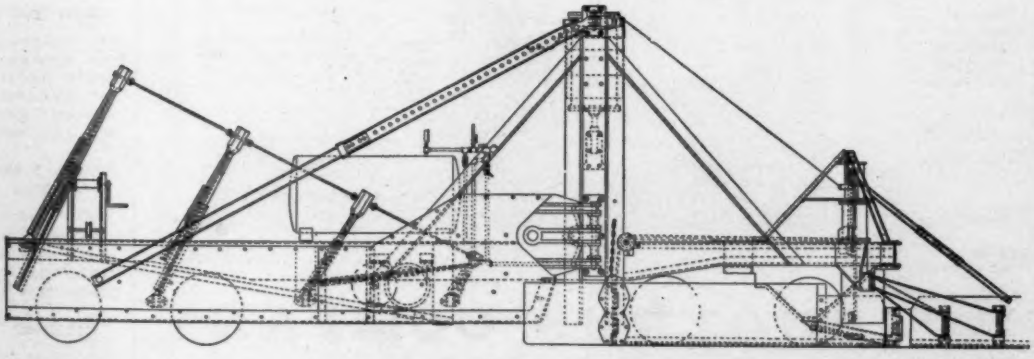
Adapted for use as a snow plow, ballast plow, flanger, scraper, bank builder and spreader.

Designed by a railroad road master.

The result of 28 years of specialization.

All steel construction.

Built in 80,000 to 100,000 pound capacities.



WRITE FOR CATALOG

The O. F. Jordan Co., *McCormick Bldg.*, Chicago

ALPHABETICAL LIST OF ADVERTISERS

	Page
American Locomotive Co.....Inside Back Cover	
Atwood's Employment Agency	67
Baldwin Locomotive Works, The	78
Bucyrus Co...65, 66, 78, 80, Inside Front Cover and Outside Back Cover	
Bureau of Engraving, Inc.	75
Columbus Chain Co.	71
Contractors' Machinery & Supply Co.	66
Davenport Locomotive Works	73
General Equipment Co.	66
Haggard & Marcusson Co.	67
Heath & Milligan Mfg. Co.	68
Hill, C. W.	75
Hills-McCanna Co.	72
Jordan Company, The O. F.	79
Kiehm & Sons, John	66
Macomber & Whyte Rope Co.	73
McCord Manufacturing Co.	74
Meisenheimer Printing Co.	77
Michel, A. J.	67
Neidlinger, Charles R.	73
Pittsburg Machinery Co.	65
Roebling's Sons Co., John A.	71
Rubberhide Co.	73
St. Louis Cordage Mills	70
Stephens-Adamson Mfg. Co.	77
Taylor Chain Co., S. G.	74
Troy Wagon Works Co.	70
Vulcan Iron Works	69
Zeinicker Co., The Walter A.	65

If you want to receive The Excavating Engineer regularly fill in and mail enclosed postal card.

One year - - - One Dollar
Six months - - - Fifty Cents

When more than one shovel is on a job, you will invariably find that the one in the hardest digging is a

BUCYRUS

40R, Bucyrus Shovel, C. E. Jamieson, at Esmond, N.D.

BUCYRUS COMPANY

P. O. BOX S

South Milwaukee, Wisconsin

NEW YORK CHICAGO BIRMINGHAM DULUTH

Other Products:

Steam Electric and Gasoline Shovels of all types
Revolving Shovels
Wire Rope Shovels
Dragline Excavators
Dredges of all types
Railway Wrecking Cranes
Locomotive Pile Drivers
Unloading Plows

Shovels

Chain Type

110-C—3½ to 6 yd.
100-C—3½ to 5 yd.
85-C—3 to 4 yd.
70-C—2½ and 3 yd.
60-C—2½ yard.
40-B—1½ yard.

Atlantic Type Wire Rope

Class 80—4½ cu. yd.
Class 60—3½ cu. yd.
Class 45—2½ cu. yd.
Class 35—1¾ cu. yd.
Class 25—1¼ cu. yd.

Revolving

175-B—3½ cu. yd.
150-B—3½ cu. yd.
18-B— ¾ cu. yd.
14-B—¾ cu. yd.